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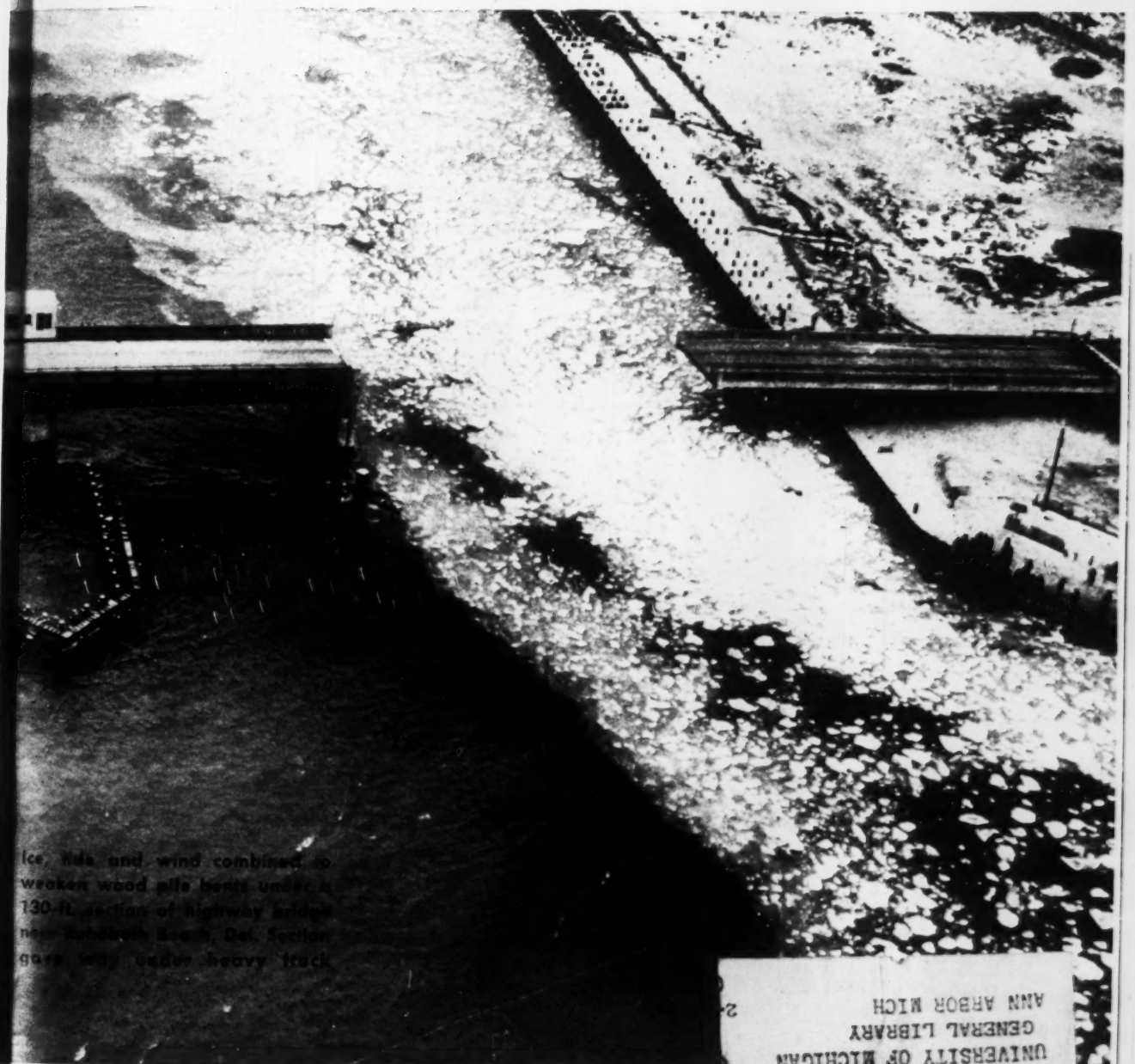

Ice, tide and wind combined to weaken wood pile bents under a 130-ft. section of highway bridge near Rehoboth Beach, Del. Section gave way under heavy truck

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News of the Week

ENGINEERING NEWS-RECORD • FEBRUARY 26, 1948 • VOLUME 140 • NUMBER 9

Highway officials see need for $22 billion construction

American Association of State Highway Officials releases results of 43-state survey of state highway department construction requirements

A total of $22,000,000,000 of construction is needed to bring the country's 600,000-mile federal-aid highway system up to the desired standard, according to a comprehensive survey completed this week by the American Association of State Highway Officials. If desired improvements on roads and streets not on this system were included, the road-building needs of the U. S. would be much greater.

Some 42 state highway departments and the District of Columbia reported to the AASHO that they had a total construction need of $19,680,000,000, as of Dec. 31, 1947. Including an estimated figure for the six states not reporting, the total is $22,000,000,000.

The 43 departments reporting said they need $9,633,000,000 to improve their 185,000 miles of federal-aid primary highways. In this work the states want to widen more than 24,000 miles at a cost of over $1,200,000,000, relocate 33,600 miles on new alignment at a cost of $3,800,000,000, resurface nearly 62,000 miles at $3,400,000,000, and build 20,000 new bridges costing more than $1,000,000,000.

The states listed their needs on 287,000 miles of federal-aid secondary roads at $4,463,000,000, of this total, $335,000,000 would be spent for widening work, $1,200,000,000 for replacements on a new alignment, $2,200,000,000 for re-construction and resurfacing operations on existing alignment, and $678,000,000 for building over 27,000 bridges.

Construction on the federal aid urban system was found to top $5,500,000,000. About $400,000,000 of this amount is wanted for widening operations, almost $4,000,000,000 for construction on new alignment, $683,000,000 for resurfacing and reconstruction on existing alignment, and $510,000,000 for building bridges.

To carry out a $19,680,000,000 program as a five-year plan, without including expenditures for maintenance operations and construction not on the federal-aid system, a yearly expenditure of $4,330,000,000 would be necessary. R. H. Baldock, president of the AASHO, said in a discussion of the study. If a 10-year plan is used, the yearly expenditure would total $2,492,000,000, and for a 15-year construction program, it would be necessary to spend $1,900,000,000 yearly.

From this study the AASHO has concluded that the President's recent request to Congress for $500 million of federal aid yearly, for improvements on the federal-aid system is reasonable (*ENR* Feb. 12, vol. p. 219). If this amount were approved by the national legislature, some $469,811,000 would be available for actual construction. Of this figure, $211,601,000 would be for the federal-aid primary system, $140,686,000 for secondary roads, and $117,554,000 for the federal aid urban projects.

PRA reports increase in highway truck traffic

Truck traffic is increasing more rapidly than any other type of highway transportation, according to reports received by the Public Roads Administration from state authorities. Increasing use of highways for commercial transportation is reflected in data compiled from truck weight surveys conducted by state highway departments.

Truck registrations rose from 4,859,244 in 1941, to approximately 6,500,000 in 1947.

James H. McGraw, Publisher, Dies

James H. McGraw, founder of the McGraw-Hill Publishing Company, died in San Francisco on Feb. 21 after a long illness, at the age of 87. He had not taken any active part in the affairs of the company since 1935 when he resigned as chairman of the board to be succeeded by his son, James H. McGraw, Jr., who is also president of the company.

Mr. McGraw was born in Panama, Chautauqua County, N. Y., in 1860, and following graduation from the State Normal School, he taught school for a brief period before starting to work as a salesman for *The American Journal of Railway Appliances* in 1884. He soon acquired an interest in the business, and by 1889 had become the owner and publisher of the paper, then known as *Street Railway Journal* and later as *Electric Railway Journal*.

At the time Mr. McGraw began his publishing career there were no accepted business standards for trade and technical journals. He saw the need for developing such standards and for improving the quality of the editorial content of his publication. The results were soon apparent in the wider acceptance of those papers, which made it possible to acquire other publications.

Mr. McGraw's active interest in the construction field began in 1902 when he acquired *Engineering Record* and undertook to increase its usefulness to its readers. Fifteen years later, following the death of John A. Hill, he negotiated the consolidation of the Hill publications, which included *Engineering News*, with the McGraw publications. This resulted in the formation of *Engineering News-Record* in 1917. A similar combination of the book publishing activities of the two organizations had been made in 1909.

At the time of the formation of the McGraw-Hill Publishing Company, it was publishing 9 journals; when Mr. McGraw retired as president in 1928, it was publishing 24, and that number now has been increased to 34 including eight published by the McGraw-Hill International Corp.

NEWS IN BRIEF

In telegraphic form, here are latest news developments on the engineering and construction front during the week.

Public Construction—Federal approval has been granted for *Ohio's* proposed $40,000,000 hospital building program . . . At *Richmond, Ind.*, a $1,000,000 psychiatric unit is to be erected as the first part of a $4,000,000 expansion of the General Hospital . . . *Rockford, Ill.*, airport authorities have approved construction of three runways as the first step in an airport program to cost an eventual $3,000,000.

Private Construction—Blatz Brewing Co. at *Milwaukee, Wis.*, has spent $6,000,000 on the first three projects of a $16,000,000 expansion program . . . Four units costing a total of $45,000,000 are planned by the Buffalo Niagara Electric Corp. in the area of *Dunkirk, N. Y.* . . . Newson Kraft Corp. plans to break ground in April for a large kraft pulp and paper mill on the Monument Ranch in *Yolo County, Calif.*, on the Sacramento River. Merritt-Chapman & Scott Corp., New York, is the general contractor . . . The Canadian Parliament has authorized a $4,000,000 hydroelectric power development near *Yellowknife, N. W. T.* . . . The Harrisburgh Gas Co. has awarded a $1,250,000 contract to the United Engineers and Constructors of Philadelphia, Pa., for a catalytic gas cracking plant at *Steelton, Pa.*

Highways—*Boston, Mass.*, is seeking a state appropriation of $4,000,000 for street repairs . . . *North Carolina* state highway revenues during the first seven months of the fiscal year have averaged $433,500 in excess of estimates . . . A second roadway on the *Quebec* bridge over the St. Lawrence River is planned . . . A $2,000,000 improvement project is planned for the Lincoln Highway between *Gettysburg* and *Chambersburg, Pa.* A new roadway of three and four lanes will be built.

Educational Institutions—Bids are being called for a library building at the University of Alberta, *Edmonton* . . . The University of Pennsylvania, *Philadelphia*, has plans for an $8,500,000 hospital, a $6,000,000 library, a physics building to cost $2,000,000, and a $2,000,000 building for the Wharton School.

Miscellany—Production and sale of power by Santee-Cooper, South Carolina's $50,000,000 hydro-electric project at *Moncks Corner, S. C.*, broke all previous records during January. Some 84,625,000 kwh. of electricity were generated during that month, compared with the all-time high set in December of 72,230,000 kwh. . . . *Medford, Ore.*, carpenters have been granted a wage scale of $1.90 an hour, up 15 cents, under an agreement reached with contractors of the area. The scale is retroactive to Jan. 1. . . . A new chemical test that will reveal presence of pollution other than mine acids in the rivers at *Pittsburgh, Pa.*, was described recently by K. M. Madison of Mellon Institute for Industrial Research. Presence of mine acids in the rivers masks pollutants like domestic sewage, explained Mr. Madison. . . . First priority construction of the $208,000,000 South and Central Florida flood control plan will include additional outlet capacity for Lake Okeechobee according to Gov. Millard F. Caldwell.

***Drug Plant**—One of the largest drug manufacturing plants built in the south since the end of the war was recently opened by C. H. Phillips Co., a division of the Sterling Drug, Inc., at Gulfport, Miss. The 342 x 140-ft., one-story structure of buff-brick, steel-frame construction, is completely air-conditioned and contains complete installations for the manufacture, bottling, and shipping of drug products. W. Stuart Thompson and Phelps Barnum, New York City, were architects, Strobel and Saltzman, New York, were structural engineers, and George P. Hopkins, Gulfport, was contractor.*

Initial work starts on Mississagi power

The Hydro Electric Power Commission of Ontario has started preliminary work on its Mississagi power project near Thessalon, Ont., 53 miles east of Sault St. Marie. It is planned to generate 58,000 hp. of electricity from a 40-mile storage reservoir. Actual construction is expected by the end of the year. The estimated cost is about $19,000,000.

THE COVER PICTURE

The south section of the Charles W. Cullen Bridge, carrying the Ocean Boulevard over Indian River Inlet between Rehoboth Beach and Bethany Beach, Del., collapsed Feb. 10, causing the death of three persons whose truck plunged into the water when the bridge section fell.

Built in 1938, the 1,200-ft. bridge has a concrete central pier to support a swing span, and side approaches are of laminated wood and concrete decking, supported on wooden pile bents.

Edward V. Rose, division engineer for the state highway department, said an unusual combination of ice, wind and tide caused the disaster.

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Distributors see competition return, call outlook good for coming period

Associated Equipment Distributors told most production catching demand—A. F. Garlinghouse named president

An almost complete return to a competitive selling basis, with wartime and postwar order backlogs a thing of the past is now the rule in the construction equipment industry, distributors were told last week.

Meeting in Chicago for their 29th annual session, members of the Associated Equipment Distributors heard speakers stress the fact that backlogs exist today only in the field of track-type tractors, power graders, heavy cranes and excavators, and that in the lighter equipment class equipment production has almost caught demand.

The 1,400 delegates heard discussions of the effect of European aid on their industry, and were told of tightening credit conditions to be expected during the four-day session. They elected A. F. Garlinghouse of Los Angeles as president of their organization, to succeed W. A. Danner of Boston.

Convention speakers said that domestic sales of construction equipment totalled $700,000,000 in 1947, and that 1948 volume should exceed this figure. Although the concensus of the meeting was that light equipment could very nearly meet potential demand, any definite statement to that effect was clouded by the uncertainty of the effect of the proposed European aid plan and possible price rises on materials going into the equipment. Most delegates seemed hopeful for price stabilization in the field and in construction generally.

Credit tightens

Distributors and business generally will operate under tightening credit reins, the convention was told. Kenton R. Cravens, a St. Louis banker, said that current conditions "give bankers no choice but to raise the price of their loans."

"Tightening credit," Mr. Cravens said, "is no indication of weakness—the nation's credit system is probably the strongest in its history." However, he advised distributors to "form strong financial connections, contract and consolidate business rather than expand, budget future credit requirements to the minimum, and limit business volume to keep within that budget."

The banker's remarks confirmed a trend discernible recently, distributors said. In January, the AED reported results of a survey that showed most distributors had noted a decided slowdown in collections in recent months. The distributors themselves, the survey indicated, were following a more cautious credit policy, induced partially by steady tightening of bank credit.

A. F. GARLINGHOUSE
. . . president of distributors

During the same months, an increase in trade-ins of 25 to 100 percent was reported from about one-third of the states, and buyers were said to be demanding "excessive" trade-in allowances.

Good progress was reported to the convention regarding the work of the joint AED-AGC committees on accident prevention and standardized repair parts manuals. President Winkelman of the AGC in his talk asked for the support and advice of the distributors, locally and nationally, in aiding the revision of contract specifications for public works to permit use of new methods and mechanized equipment which will reduce costs. This liberalization of specifications will help in accomplishing the large construction program which the AGC foresees for many years ahead.

Other discussion

Participation by the AED in the Army's Affiliation Program has been in effect since October. A number of member companies already have completed agreements with the Army for establishing special service units in the Organized Reserve Corps. Col. Robert J. Fleming, Jr., who heads the program for the Corps of Engineers, told the convention in the course of a convincing talk on the need for such units and the benefits to be derived from them. President Garlinghouse assured Colonel Fleming that the AED will continue its wholehearted support.

In a discussion of taxes and tax consequences, E. Charles Eichenbaum, Little Rock, Ark., pointed out that under our present tax structure a contractor may find it more profitable to purchase new equipment in a year when he is taking a loss than in a year when he is making money.

Government debt and fiscal policies were stressed also in a strong plea by Ed Wimmer, vice president of the National Federation of Small Business, Inc., for preservation of the independent businessman as the only sure bulwark against economic socialization.

Seek bids on Hungry Horse project

The U. S. Bureau of Reclamation last week called for bids on what its engineers said will be the fourth largest concrete dam in the world.

The structure will be the multiple-purpose Hungry Horse Dam, located on the south fork of the Flathead River, nine miles southeast of Columbia Falls, Mont. Bids will be opened April 1 at a government camp already completed near the dam site.

Planned for irrigation, power production and flood control, the dam (*ENR* July 17, 1947, vol. p. 89) will be a concrete arch structure 520 ft. in height and 2,115 ft. long, requiring about 3,000,000 cu.yd. of concrete. It will create a reservoir with a capacity of 3,500,000 acre-ft.

The only concrete dams exceeding Hungry Horse in height are Hoover Dam, 726 ft.; Shasta, 602 ft.; and Grand Coulee, 550 ft.

The construction contract to be awarded April 1 includes a power plant to house four 75,000-kva. generators to produce power to be integrated with the Bonneville and Grand Coulee system and other plants of the Pacific Northwest.

A "glory hole" type spillway will be utilized to carry overflow from the reservoir. It will consist of a reinforced concrete-lined vertical shaft, connecting with a horizontal tunnel 24 ft. 6 in. in diameter, driven through the abutment.

Major contracts now in force on the project include excavation of a 1,100-ft. diversion tunnel, clearing 1,335 acres of reservoir, relocating forest roads, constructing a portion of the camp, access roads, and building a 12,500-volt transmission line and distribution system.

DEVELOPMENTS BEYOND U. S. BORDERS

Digested from reports by Engineering News-Record correspondents and the McGraw-Hill World News Bureau

Afghanistan begins $17 million irrigation and highway program—Appoint Gail Hathaway chairman of U. S. Large Dam Commission—Reveal plans for international soil mechanics conference

Afghanistan—A $17,000,000 irrigation and highway building construction program is now underway according to M. K. Ludin, minister of public works, who is now in the United States.

Preliminary work on the program has been going forward for about two years, but actual construction started only a few months ago. The program is the first concrete result of large-scale planning that calls for a tremendous eventual increase in the country's hydroelectric production, which might be increased to about 200,000 kw. from the present 10,000 kw.

The present development consists of two principal projects—one the development of the Helmand River valley in southeastern Afghanistan, and the other the construction of a modern highway 170 miles long from the town of Torkham at Kyhber Pass on the Indian border westward to the Afghanistan capital of Kabul.

The Helmand River work will also include a highway project—a 140-mile all-weather road from Chaman to the city of Kandahar and the town of Girishk. The project will include a storage dam 200 ft. high on the Helmand River, probably of earthfill construction, to be known as Kajkai Dam, and several smaller storage facilities to permit irrigation of between 400,000 and 500,000 acres. Extensive canal work will be required to permit irrigation of a valley some 300 miles long.

The Torkham-Kabul road will parallel the Kabul River and will involve extremely difficult engineering problems since the river valley drops almost 2,500 ft. in a distance of 30 to 40 miles. This project will also involve construction of a series of storage dams on the tributaries of the Kabul River to supply drinking water to the city.

Overall planning for the two projects is being handled by Morrison-Knudsen Co. through its subsidiary, Morrison-Knudsen Afghanistan, Inc., of New York. Detailed engineering for the hydro-electric facilities is being handled by another Morrison-Knudsen subsidiary—the International Engineering Co., of Denver, Colo.

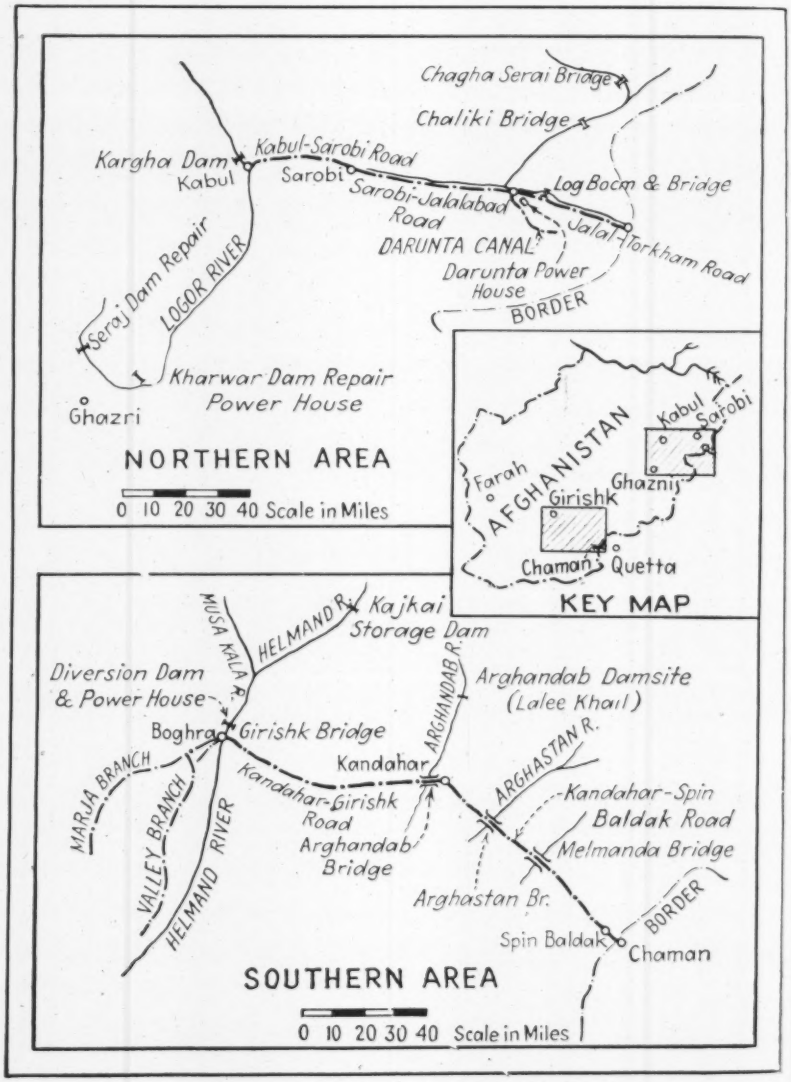
Mr. Ludin, who took a civil engineering degree at Cornell University, New York, in 1936, served an apprenticeship with the U. S. Bureau of Reclamation at its Denver office until 1938. He joined the Afghanistan Ministry of Public Works in 1939 and became Minister of Public Works in 1946.

Scientific meetings . . . .

The United States National Committee of the International Commission on Large Dams has announced the appointment of Gail Hathaway, special representative to the chief of Army Engineers, as chairman of the national group.

The action was one of two events last week in the field of international scientific organizations. At the same time the United States National Committee on Soil Mechanics has announced receipt of a full program for the second international conference on soil mechanics and foundation engineering, to be held in Rotterdam, Holland, June 21-30.

The Large Dams meeting, the third of its kind, is scheduled to be held



early in June at Stockholm, Sweden (*ENR* Sept. 25, 1947, vol. p. 423).

The U. S. committee now includes: Mr. Hathaway, Joel D. Justin of Philadelphia; Samuel B. Morris, general manager and chief engineer of the Los Angeles water department; John L. Savage, consulting engineer, Denver; Carl P. Wetter, chief of the office of river control of the Colorado River, Bureau of Reclamation; and Frank A. Banks, manager of the Columbia River district for the Bureau of Reclamation.

The U. S. delegation to the dam congress will present some nineteen papers on subjects including economics of large projects, special cements for dams, use of reactive aggregates, construction of dams on frozen ground, and other difficult foundation conditions.

The soil mechanics conference—designed so that delegates to the large dams conference can attend its sessions after closing of the meetings in Sweden—will open officially on June 22, according to the U. S. committee for the conference, which has its headquarters at the Technological Institute, Northwestern University, Evanston, Ill.

The committee said that travel arrangements are being made through Lissone-Lindeman, 509 Fifth Ave., New York 17, N. Y., so that delegates can arrange group travel on U. S. Lines ships.

The sessions will include papers on various phases of the soil mechanics work, as well as fieldtrips in north Holland to show delegates the work that has been done in reclaiming land from the sea, both before and after the late war. Meetings will be held in the Palace Theatre at Rotterdam.

Transport . . . .

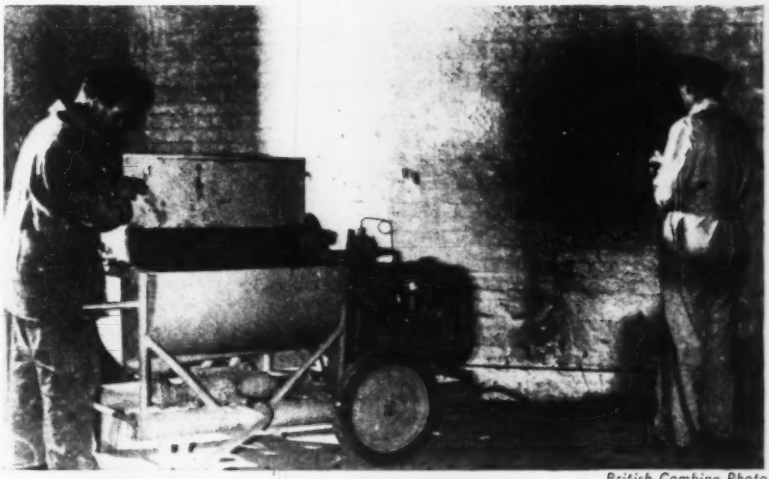
Puerto Rico—A far-reaching airport construction program, to cost $14,538,000 during the next three years, has been recommended by the Civil Aeronautics Administration.

The program would include construction of the Isla Verde international airport, to cost about $12,000,000, and would add seven other airports to existing facilities.

The Puerto Rican government is still awaiting a final decision by U. S. Navy authorities on its objections to construction of the Isla Verde airport at a previously selected site. The Navy charged that the airport operation would interfere with a new Navy's radio station. An alternate site has been recommended.

Portuguese East Africa—About $4,000,000 is to be spent to complete the Tete-Beira railway line to provide a sea outlet for coal deposits at Tete. In addition, nearly $4,000,000 will be spent in the port of Lourenco Marques on harbor equipment and a new power station.

Argentina—The third set of bids on the proposed $32,000,000 Argentine-Boliva railway will be called March 1, government officials said. The project, expected to cost about $3,000,000, will call for construction of the Yacuiba line to Santa Cruz de la Sierra and Sucre, Bolivia.



British Combine Photo

***Spray Gun House**—A material that can be sprayed up to 8 in. thick and sets within 50 minutes has recently been developed by a British concern for use in housing. Made of a mixture of lime, cement and Vermiculite, the covering is said to be non-cracking, will stick to wood or metal, takes nails or screws and can be cut with an ordinary saw. Developers see the material as a means of speeding house construction, and added that higher fire resistant qualities of the material add to its value. Known as "Pyroc," the product is produced by the British firm of C & T Painters, Ltd., Mordaunt Road, London, N. W., 101.*

Radio-active waste . . . .

England—Special precautions are being taken by the British Ministry of Supply to ensure that water of the Thames River used at England's atomic energy research establishment at Harwell is returned to the river free from the risk of radio-active contamination.

In a joint announcement, the Ministry of Supply, the Ministry of Health, the Metropolitan Water Board and the Thames Conservancy District said that precautions had been adopted after close consultation.

The precautionary measures, advised by the Medical Research Council's research committee on the medical and biological applications of nuclear physics, are based on the principle that a certain amount of radio-activity in drinking water can be tolerated with safety by human beings. The tolerance laid down by the Research Council for the Harwell effluent is such that medical and biological effects would be negligible for all practical purposes, government engineers said.

Roughly 1,000,000 gpd. will be drawn from the Thames when the Harwell establishment reaches its full stride, although not all of the water will be exposed to radio-activity. The greater part of the water will be used for cooling of plant and ordinary domestic requirements at the establishment, while the remainder will be used for research processes—some of them radio-active—and a carefully controlled separate water system will be installed. The most highly active portion of the water will be segregated and not returned to the river. The remainder of the process water will be sent to storage tanks where it will be tested by medical officers for compliance with the agreed tolerances, treated for chemical impurities and then mixed with the domestic waste water before being discharged back into the Thames. A new weir is being constructed at the point of discharge to mix the water with much greater quantities of river water immediately upon joining the main stream. Regular tests of the river water will be made also at points farther down the Thames to assure that the procedure is working properly.

Western areas face drouth conditions as precipitation stays below normal

Survey shows Southern California, Arizona, New Mexico and Nevada far under normal water needs

While most of the United States last week worked to ward off floods that followed an abnormal spell of mild temperature, four western states were facing an already serious drought, an *Engineering News-Record* survey showed.

Subnormal precipitation in Southern California, and Nevada, Arizona and New Mexico threw into sharp relief the struggles of those states for additional water supplies, and forecast possibly serious consequences to the production of crops and hydroelectric power. Although some rain has fallen in the area within the last two weeks, weather men classified it as "shower" precipitation and not the "heavy" that is needed to relieve the situation materially.

An indicator of the drought in the southern half of California was the rationing of water in several cities, and an unprecedented appeal from the huge Pacific Gas & Electric Co. to all power users to conserve electricity because of the lack of water in the company's hydro projects. Slowing of electric clocks because of frequency fall-off became a daily occurrence along the Pacific coast. The power curtailment has already affected several lumber mills in northern California and southern Oregon which were forced to shut down or seriously reduce their operations.

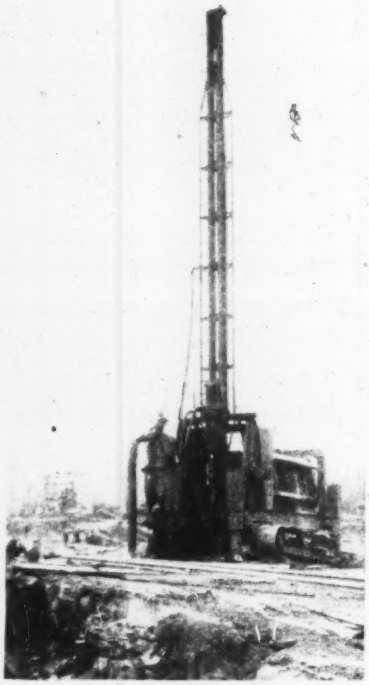
California situation

Water resource conditions in California were sharply divided, with the northern part of the state being in fairly good shape while the southern part suffered. Shasta reservoir held 2,730,000 acre-ft., as compared to 2,125,000 at the same period last year, thus assuring the Sacramento Valley of irrigation water.

To the south, however, Friant Dam near Fresno recently had only 135,000 acre-ft. of storage, as compared with 306,000 at the same date a year ago. The net result of the drought included excessive pumping from water tables that were already low—the Pacific Gas & Electric Co. reporting that electricity for pumping on its system brought the demand to 200,000 kw. above normal.

Early snows in southern California mountains were washed away by December rains, and in some places snow-cover was as much as 50 inches below normal. Two cities—Santa Barbara and Ventura—had to resort to ordinances calling for rationing of water and imposing fines for failure to abide by the ruling. Santa Barbara is already planning to vote on a $2,000,000 bond issue in March to raise the city's Gilbraltar Dam, where silting has cut the 15,000 acre-ft. capacity nearly in half. Present relief for Ventura will come from wells now being drilled and from the recently completed Matilija Dam.

Los Angeles reservoirs now hold 56 percent of capacity. In San Diego there is no threat of water shortage because of the city's recent tie-in with the Metropolitan Water District through the San Diego aqueduct.



***Piston drill for blast hole**—At the General Crushed Stone Co.'s Whitehaven, Penna., quarry, 6 in. dia. holes for blasting are being cut by a piston-type drill in which the drill stem is held, turned and driven by a pneumatic hammer. The machine works on the principle of steam drills, extensively used up to the early 1900's, but since used only for submarine drilling. Mounted as a complete unit on a crawler tread, a 500-cu. ft. compressor supplies air to drive the hammer and lifting mechanism. Separate air motors drive each crawler for moving and spotting as well as for tool handling and to operate hydraulic positioning jacks and an air collector.*

In central California, San Francisco and Oakland have no domestic water supply problems, but smaller towns with no tie-in to the larger water systems are worse off.

Although municipal water supplies in Arizona are considered adequate, the southern part of the state faces another tight water year. The Salt, San Carlos and Gila River watersheds have had deficiency runoffs since 1940 and dams of the Salt River Valley Water Users Association are at dangerously low levels. With a total capacity of 1,650,000 acre-ft., the dams now hold only 228,000 acre-ft. San Carlos reservoir, with a capacity of 1,200,000 acre-ft. is empty; Lake Pleasant, with a capacity of 179,000 acre-ft. is nearly empty, and Horseshoe and Bartlett reservoirs together have less than 6,000 acre-ft.

At present, snow cover in Arizona is about one-third of last year and state officials have reported that groundwater supplies have been dropping at such an alarming rate that a special session of the legislature has been called to draft a groundwater control law. (*ENR* Jan. 29, vol. p. 144).

In connection with the situation in Arizona, the national Congress now has before it a report on the proposed Parker route pumping project to bring Colorado River water to central Arizona. However, before this project can be started, the states of the lower Colorado basin must agree on this plan or some other proposal to permit use of the water allotted to them.

The new report was prepared in response to a request by Senator Millikin of Colorado who is chairman of the Irrigation and Reclamation Subcommittee of the Senate Public Lands Committee. The project approved by Secretary Krug is one of three major developments that have been under study for the last few years to permit Arizona to use a part of the Colorado River flow as supplemental water for 640,000 acres now under irrigation (*ENR* May 24, 1945, vol. p. 742). It would not permit development of new irrigation lands, but it would provide more than 770,000 kw. of hydro-electric power. A dam 637 ft. high on the Colorado River at the head of Lake Mead, to be known as Bridge Canyon Dam, is included in the development to create a 3,720,000 acre-ft. capacity reservoir. The entire cost of the project would be more than $738,000,000.

New Mexico below normal

New Mexico, although its water resources are still not up to normal, is better off than in 1947, which was an abnormally low water year. The brightest spot for New Mexicans was the

Tumcumcari Irrigation District, where Conchas Dam is now over three-quarters full due to precipitation in the Canadian River watershed during the last two years. However, Elephant Butte Irrigation District has already announced cuts in irrigation water allowances, and its hydro-electric plant has been shut down for more than seven months, with the El Paso Electric Company's steam plants furnishing power.

Domestic water for Santa Fe seemed adequate because of recent enlargement of the city's reservoir, while Albuquerque, where there was some water rationing last summer, expects an adequate supply this year because of new wells, pipelines and pumps.

Although not reported in such detail, the situation in Nevada closely parallels that of New Mexico, with abnormally low precipitation promising low water yields for the coming year.

Rainmakers are busy

Results of the drought in the Southwest have been many and varied, and newspapers have devoted many columns to unique situations. Proposed remedies range from importing Indian chiefs into southern California from Oregon to make appeals to the rain gods, to the suggestion by a Los Angeles official that a $1,000,000 reward be offered to anyone who can devise a method for that city to get water from other than its present sources.

Airborne rainmakers have been dumping dry ice into clouds when they could find them, with varying success, while lawsuits have been threatened when clouds were drained of water that might have fallen in adjacent areas. Wells are being drilled frantically and it is said that "every drill rig between the Pacific Ocean and Texas is busy."

Low bid of $1 million on Baldhill Dam, N. D.

The Al Johnson Construction Co., Minneapolis, Minn., was low bidder for second-stage work for Baldhill Dam on the Sheyenne River north of Valley City, N. D. when bids were opened Feb. 11 in the office of the St. Paul District Engineers.

The Minneapolis firm bid $1,028,882 for excavation work, construction of a concrete spillway structure complete with Tainter gates and accessory units, placing of backfill and compacted earthfill embankment, protection stone and appurtenant work at the Baldhill dam site.

On the first phase of the project only cleanup work remains to be done.

Set new bond bid call for Tacoma Narrows span

Declaring that a new traffic count has indicated tolls from the reconstructed Tacoma Narrows suspension bridge will pay off a $14,000,000 bond issue, the Washington State Toll Bridge Authority has called bids a second time for a bond issue to finance the structure.

No bids were received at the first opening last December. An earlier traffic count had resulted in a recommendation for a $10,000,000 bond issue and, when higher construction costs necessitated a $14,000,000 issue, bond houses apparently questioned the security of such an investment. Pending outcome of the bidding, the authority is holding in abeyance low bids totaling $11,196,584 for the bridge construction, received some weeks ago.

Give unfavorable report on Snowflake project

Secretary of the Interior J. A. Krug has announced his approval of the department's report, sponsored by the Bureau of Reclamation, recommending that the proposed Snowflake irrigation project in Arizona be not authorized at this time, but be left open for reconsideration.

The investigation disclosed that although the proposed project has engineering feasibility, further water resource development in the area at this time would not be economically practicable.

The project is in Navajo County, about 30 miles south of Holbrook, and involves 18,000 arable acres of which 2,200 acres are now under irrigation, the report said.

PERSPECTIVE . . . .

Prefab subsidies

The government's effort to help the prefabricated home industry through guaranteeing markets for its products hasn't been successful to date.

The Office of the Housing Expediter reported last week that the program—which called for production of some 90,000 units, of which the government would guarantee a market for 65,000—had actually produced only 3,000 units. Of the 3,000, about 300 are now in government warehouses after the manufacturers found they couldn't sell them.

The U. S. has ended the program legally, and is now engaged in terminating outstanding contracts. To date, the program has cost the government about $3,250,000, and is expected to total $3,600,000 by the time all contracts are cleared up.

On their own, the prefabricators have done better. In 1946 and 1947 the active firms succeeded in producing and selling about 70,000 units without help from the federal government under the marketing plan.

At present, according to the Prefabricated Home Manufacturers' Institute, there are 80 firms in the field, with about 1,800 dealers or dealer-erectors handling their products. By summer, about 3,000 dealers may be operating for these firms. The 80 active firms represent a considerable shakedown from the wartime high of about 220 prefabricators.

However, while one type of subsidy was abandoned, a new one was introduced. The Federal Housing Administration announced it had insured its first loan to cover the factory costs of a prefab manufacturer. Commissioner Franklin D. Richards said the loan, completed under section 609, Title VI of the National Housing Act of 1934, was made by the Trust Company of New Jersey to Housemart, Inc., of Cleveland, Ohio to finance manufacture of the prefabricated portions of 194 homes that have been sold to a Cleveland builder.

The 1934 act was amended last year to permit loans of this type, but its provisions expire March 31. To be eligible for FHA insurance under section 609, a loan may be for an amount up to 90 percent of FHA's estimate of the manufacturing cost of those parts of the houses prefabricated in the plant. Cost of site and erection on the site may not be included, and the manufacturer must have a binding purchase contract for the houses to be produced with the loan.

Behind the continuing government interest in prefabrication is the thinking of many industry and government leaders who believe that prefabrication eventually will present the only real solution to the problem of producing housing at costs low enough to make it available to the average-income wage earner.

HIGHLIGHTS OF MUNICIPAL DEVELOPMENTS

Summarizing current activities in city engineering and construction throughout the country.

Phoenix reaches construction peak on $8.5 million sanitary facilities program—Boston gets elaborate expressway plan—Anti-smoke programs under discussion

An $8,500,000 sanitary facilities expansion program at Phoenix, Ariz., is now nearing a construction peak, with a force of more than 700 men working on the multiple-phase project.

The program in the Arizona capital was the largest of a series of water and sewerage programs reported by municipalities during the last week.

Some $6,600,000 will be expended on the Phoenix municipal water treatment plant and distribution system additions (*ENR* Feb. 6, 1947, vol. p. 219) and another $2,500,000 on new sewers and disposal plant additions. Major water-system expenditures include a $1,000,000, 30 mgd. filter and softener on the Verde River 33 miles east of the city; a $2,000,000 pipeline project to link the water sources with reservoirs, and $250,000 for a 20 mg. reservoir eight miles east of the city. Additionally, the work will include $300,000 for booster pumps, stations, electrical lines, transformers and motors.

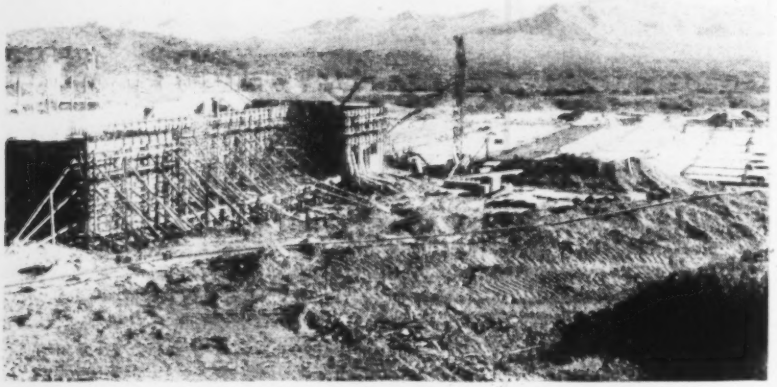
All construction on the water supply program is pointed toward an October completion, and city officials hope that by the summer of 1949 all municipal water will come from the Verde River to end the city's dependence on deep wells.

Additions to the city's present sewage treatment plant will include two new sludge digesters, and two primary and two secondary clarifiers; and replacement of six and one-half miles of lines partly through the heart of the city.

Other developments in the municipal sewer and water supply field included: Los Angeles, Calif., officials said the Pacific Bridge Co. was low bidder at $3,989,000 for construction of a digestion system for the city's $30,000,000 sewage disposal program. Engineer's estimate for the job was $4,219,684.

The work is part of a 245 mgd. high-rate activated sludge treatment plant (*ENR* May 29, 1947, vol. p. 874) being built to reduce contamination of some 11 miles of southern California beaches.

The Minnesota Division of Water Pollution Control announced it had examined and approved new sewer systems and treatment plants for the communities of Minnesota, Wanda and DeGraff, treatment plants at Pine City, Faribault and Ely, and plans for extensions and improvements at 20 other cities and villages. Key West, Fla., was warned by the state board of health that its treatment plant was rapidly nearing its capacity, and would have to be enlarged; Akron, Ohio, voters will be asked to vote in May on a $4,000,000 sewer extension program; and officials of 13 suburbs of Cleveland, Ohio, began a series of meetings to thresh out mutual problems of sewage disposal.



***Filter Plant**—Construction is under way on a $1,000,000 water filter plant—first unit in a $6,000,000 water improvement program for the city of Phoenix, Ariz. The plant is located on the desert, 33 miles northeast of the city on the Verde River, and will include a four-story chemical building and settling beds with a capacity of 30,000,000 gal. of water daily. Contractor is the Del E. Webb Construction Co. and the Arizona Sand & Rock Co., both of Phoenix.*

Non-stop Boston traffic

An elaborate highway program that would provide motorists in all parts of the Boston, Mass., metropolitan area with non-stop travel into the downtown district was placed before Gov. Robert F. Bradford and the state legislature last week.

Authored by the Joint Board for the Metropolitan Master Highway Plan, in cooperation with its consultants, the plan envisages a 10-year program for construction of a network of new roads and is so broad in scope as to relegate such highways as the Worcester Turnpike to the level of local streets. Briefly, it calls for six major highways, radiating out from an elevated highway in downtown Boston, connecting the city's center with an outer circumferential route skirting the suburbs in a huge three-quarter circle. Many of these high-speed, controlled-access roads would be built over entirely new right-of-way.

Additionally, the plan calls for rehabilitation of existing routes.

While Boston officials considered the implications of this program, other cities also continued their fight against traffic congestion. At Council Bluffs, Iowa, the city planning commission heard Ralph R. Reinhardt, of the consulting engineering firm of Hare and Hare, Kansas City, Mo., tell them of the need for a third bridge across the Missouri River to connect Council Bluffs with Omaha, Neb. The village board of Cahokia, Ill., signified its willingness to build the western approach to a proposed toll bridge across the Mississippi River.

Five communities advanced on their parking problems. Sandusky, Ohio, councilmen approved legislation for the installation of 400 parking meters;

Baltimore, Md., created an Off Street Parking Commission whose five members were charged with acquiring and developing sites for parking areas; Milwaukee, Wis., councilmen received a new master plan that included provision for downtown parking lots; St. Louis, Mo. was authorized in a state senate bill to install parking facilities—either lots or buildings, and Muncie, Ind., merchants proposed a program of municipal parking areas to relieve the business section.

And in New York City, Robert F. Wagner, chairman of the City Planning Commission, sounded a sobering note in the apparent demand for creation of special authorities to handle the parking problem. "I seriously doubt," Mr. Wagner said, "if a traffic authority could market its bonds for garage construction unless it were given monopolies in specific areas—which would completely eliminate private investment and enterprise in that area."

Smoke control

Louisville, Ky. must change its anti-smoke ordinances to bring small dwellings—those containing four or less living units—under control of the city's Smoke Commission, according to J. O. Pasco, city combustion engineer. His criticism highlighted efforts of many cities to control increasingly heavy smoke palls over their municipal limits as health and business measures. Other comments on the city's ordinances included criticism of a provision allowing six minutes in any hour for cleaning fires—during which period no limit is placed on smoke emitted.

Richmond, Va., also operating under a smoke-control ordinance, was told that the problem of clearing its skies would be long in solution, until residents themselves learn to handle fires properly. Harry C. Ballman, newly-employed smoke engineer, said in an interview that he was against clamping heavy fines and penalties on violators, preferring the longer—but surer—method of education.

Airports

The Metropolitan Airport Commission of St. Paul, Minn. last week ended its months-long discussions over the site of a new airport to serve both St. Paul and Minneapolis by voting to continue the use of and expand the existing Wold-Chamberlain Field.

The commission action envisages the immediate purchase of 1,800 acres of unimproved land, west of the present 641-acre airport, the immediate construction of a new 6,250 ft. northwest-southeast runway, and the extension of the present northeast-southwest runway to 6,250 ft.

At Toledo, Ohio, officials were informed that the Civil Aeronautics Administration had approved the development of a two-runway airport for Toledo. Weather conditions that bring almost constant winds make the 2-runway pattern feasible, engineers have reported.

***Suspension Footbridge**—A new-type multiple-span suspension footbridge at Lumberville, Pa., has its main cables spaced 9 ft. apart and consists of 4 1/2 spans, for a total suspended length of 688 ft. The only stiffening elements are the cable system and the concrete walkway. This walkway, prestressed in directions parallel and at right angles to the centerline of the bridge, requires no support excepting on a line directly under each main cable. Erected by John A. Roebling's Sons Co., the structure was built by the Delaware River Joint Toll Bridge Commission across the Delaware between Lumberville and Raven Rock, N. J.*

New plumbing code for housing completed

A new plumbing code for housing that may permit a building cost saving of $40 to $50 per dwelling unit in some localities on housing construction has been completed by the U. S. Housing and Home Finance Agency in cooperation with labor groups, industry, and other federal agencies. The code has already been adopted by Puerto Rico and is being studied by state and local governmental groups.

The new code is the result of a comprehensive 2-year study of desired improvements for the plumbing systems of all types of buildings and is based upon extensive research at the Bureau of Standards (*ENR* April 24, 1947, vol. p. 709). This latter work included complete plumbing installations utilizing transparent plastic piping to permit visual observation and study of the discharge and flow characteristics in pipes, traps, and vents. When considered necessary, the tests were repeated with standard iron pipe and fittings to check results with the plastic piping.

Complete full-scale systems in a house with one bathroom, kitchen and basement and with various types of venting were studied. Other tests dealt with the plumbing system for a 2-story duplex house with bath-rooms back to back on the second floor and kitchens in a similar arrangement on the first floor. Self-syphonage of fixture traps was carefully studied, as were the advantages and disadvantages of wet-vented and stack-vented systems.

Leonard G. Haeger, director of the technical office of HHFA, was in general charge of the program with Vincent T. Manas, chairman of the Uniform Plumbing Code Committee, supervising the work. This latter group included representatives of the National Association of Master Plumbers, United Association of Journeymen and Apprentices of the Plumbing and Pipe Fitting Industry, the U. S. Public Health Service and the Bureau of Standards.

Copies of the new code may be obtained without cost as Technical Paper No. 6 of the technical staff of the Housing and Home Finance Agency, Normandy Building, 1626 K Street, N. W., Washington 25, D. C.

Army military construction program tops $300 million, report discloses

World-wide building projects range from airports in Alaska to ports and canals in Greece, survey shows

The military construction branch of the Corps of Engineers has now undertaken about $300,000,000 worth of national defense construction, including many projects outside the continental United States under authority of recent appropriations.

To bolster this program, the President in his recent budget message (*ENR* Jan. 15, vol. p. 75) asked Congress to supply an additional $155,000,000 in cash and $60,000,000 in contract authority for this work for the present fiscal year.

An *Engineering News-Record* survey of the Army's program last week showed four major overseas areas of army construction, as well as considerable work for military services in the United States.

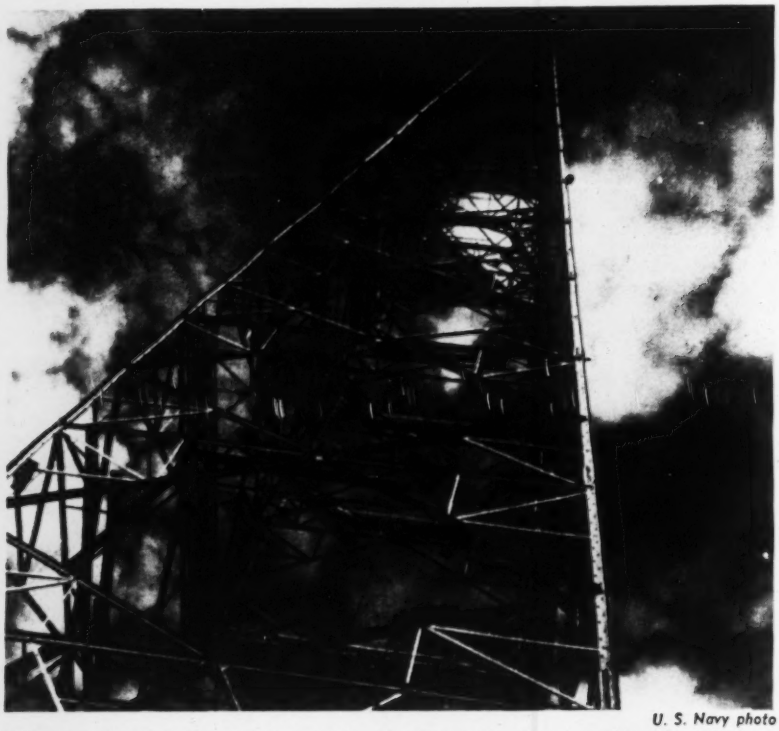
Perhaps the biggest army program is in Alaska. These include:

An airbase for very heavy bombers, with r[illegible]ways designed to accommodate the huge B-36 bomber, is well under way about 26 miles southeast of Fairbanks. Work in progress includes a $1,000,000 warehouse, $2,500,000 worth of housing, $3,300,000 of runway construction, and about $12,000,000 of technical and operating facilities and utilities.

Some $10,000,000 worth of work is under way at Fort Richardson and adjacent Elmendorf Field, including $11,500,000 for housing, and considerable work on utilities, remodeling of structures built during the war and a warehouse. At Ladd Field, near Fairbanks, a $5,000,000 program primarily designed to provide housing and utilities is under way.

Other Alaskan work includes preliminary construction for a field near the town of Nenana; a $3,000,000 program at Whittier, the coastal port of the Alaskan Railroad; and a $2,500,000 Loran air-navigation project near Point Barrow which includes steel-frame radio towers 600 ft. high.

Fay, Spofford and Thorndike, of Boston, Mass., is acting as architect-engineer for all the Alaskan projects of the Corps (*ENR* Jan. 2, 1947, vol. p. 1). Most construction contracts are being handled by a combination of S. Birch & Sons Construction Co., Al Johnson Construction Co., and C. F. Lytle Co., with offices at Seattle, Wash.



U. S. Navy photo

600 ft. of steel tower pierce the sky near Pt. Barrow, Alaska, where a new Loran air-navigation station is under construction. An Army engineer project, the two towers were built by the Navy's Bureau of Yards and Docks, which had construction forces at work on other projects in the area.

Key jobs in the Pacific

Projects in the Pacific include work at Okinawa, Hawaii, Manila and Guam.

At Okinawa, three projects involving a total expenditure of more than $31,000,000, are under way, consisting of work to improve Kadena airfield, constructing the Sukiran Regimental Post, and a great deal of work on housing at various bases on the island. These jobs are under contract to a combination of Guy F. Atkinson Construction Co. and J. A. Jones Construction Co., with the architect-engineer work by Holmes and Narver, of Los Angeles.

In the Philippines, $39,000,000 worth of work is now starting for improvement of Clark Field and adjacent Fort Stotsenberg, with the total expected initial cost of between $80,000,000 and $85,000,000. This installation, which will be the only major U. S. military base on the islands, will include a $9,000,000 barracks program, $10,000,000 of housing for military personnel and their families, and a $1,700,000 rehabilitation job on Clark Field runways. Johnson, Drake and Piper, the Utah Construction Co., and Groves, Shepard, Wilson and Kruge are contractors for this project, and Weihe, Frick & Kruse, of San Francisco, are architect-engineers.

On Guam, two sizable projects are under way. Near the northern end of the island, at the Army Garrison Force Base, $16,000,000 of construction is in progress, including baracks and housing and much road and utility work. At North Field a $20,000,000 program is under way for construction of barracks, roads, streets and utilities. Contractors for all Guam work are Morrison-Knudsen and Peter Kiewit & Sons, with Robert & Co., of Atlanta, Ga., as architect-engineer.

The Hawaiian work, primarily barrack construction, is going forward at Schofield Barracks and at Fort Shafter. Virtually complete is the 1,500-bed Tripler general medical hospital at Oahu, under construction for some time (*ENR* July 12, 1945, vol. p. 44).

Atlantic area work

Projects in the Atlantic extend all the way from Iceland to Panama.

In cooperation with the Icelandic government, Keflavik airport is being improved as a civil air terminal and operating base, to serve commercial

aircraft flying the North Atlantic route. Five million dollars of work at this base has been awarded to a combination of Metcalf and Hamilton Construction Co., and the Kansas City Bridge Co. Future awards, to cover construction of a terminal building and hotel, utilities building, roads, sewers and utilities, will bring the final cost to about $15,000,000. Parsons, Brinckerhoff, Hogan and MacDonald are the architect-engineers.

Harmon Field, near Stephenville, Newfoundland, is also being improved at a cost of about $12,000,000.

The Corps is reconstructing two bridges and dredging an important channel in Bermuda, for the U. S. State Department, at a cost of about $2,000,000. Fort Buchanan, in Puerto Rico, is being improved and about $2,500,000 in construction is already under way. Nearby Fort Brooke is also being improved.

In the Panama Canal Zone, a $1,000,000 project is under way at Albrook Field. The work will include storm drainage, general utilities and barracks and housing.

Program in Greece

Last summer the Army began important reconstruction work in Greece for the Department of State. More than $42,000,000 of railroad, highway and airport work is being done by a combination of three American firms—Johnson, Drake & Piper; Guy F. Atkinson, Inc., and Starr-Park and Freeman (*ENR* Aug. 14, 1947, vol. p. 227). Improvement of the big ports of Salonika, Piraeus, and Valos is going ahead, as is reconstruction of the Corinth Canal, being done by Grove, Sheppard, Wilson and Kruge, Inc., and J. Rich Steers, Inc.

A number of important national defense projects are under construction on the U. S. mainland. These include a $35,000,000 airbase at Limestone, Me., on which $13,000,000 of construction contracts have been awarded; and a $1,400,000 hangar at Rapid City, N. D. (*ENR* July 3, 1947, vol. p. 3). Lane Construction Corp. and T. W. Cunningham, Inc. are general contractors for the Maine work, while the Sternberg Construction Co. is building the structure at Rapid City.

In addition, in cooperation with the Bureau of Yards and Docks of the Navy, the corps is carrying out extensive construction at the White Sands, N. M., proving ground. Army Engineers are handling all contracts, and about $7,000,000 worth of them has already been awarded. The 1948 military construction budget, yet to be acted upon by Congress, contains nearly $4,000,000 for this location.

Truman urges new housing legislation

A program of long-range housing aids that would assist in construction of more than one million new dwelling units in urban areas during each of the next ten years was requested Feb. 23 by President Truman in a special message to Congress.

At the same time he urged extension through April 30, 1949 of the existing rent-control legislation, which restricts construction of theaters, ball parks, and similar amusement facilities.

Legislation directed toward five major objectives is sought. These are: To reduce building costs by extended research and other means; stimulate a higher volume of home building on a sustained basis with special emphasis on rental housing and with project safeguards against possible inflationary effects; assist communities in providing low-rent housing for the lowest-income groups; aid cities in rebuilding and modernizating run-down areas, and continue and strengthen rent control.

The President pointed out that less than 15 percent of new housing built in 1947 was for rental, added that much of 1947 housing was too high-priced.

President Truman urged that Title VI of the National Housing Act be extended through March 31, 1949, with an increase of $2,000,000,000 of insurance authorization with one-half of this amount being specifically allocated for insuring loans for rental housing.

Increased research to permit more economical use of materials and labor and improvement of building codes is sought. Better methods to permit large-scale construction is another benefit the President hopes to obtain.

Because many of the federal aids he seeks were said to be contained in the comprehensive Wagner-Ellender-Taft housing bill (S. 866) (*ENR* March 27, 1947, vol. p. 481) now before Congress, the President concluded by asking for passage of some such measure.

Virginia reduces loads on its highways

To avoid extensive damage of its roads during the spring thaw, the Virginia Department of Highways has placed lower allowable load limits on many of its highways. Most interstate routes retain their present 40,000-lb. limit, but the loads on other primary roads are reduced to a maximum of 24,000 lb. Virtually all secondary routes have been posted for 16,000 lb.

ALSO RECORDED . . . .

Los Angeles city councilmen debated a series of committee reports recommending that the city cease maintaining the Harriman Ave. Bridge over a railway line. Councilman E. E. Debs halted the debate. He said the bridge—in his district—had been torn down two years ago.

Educational note: Massachusetts drug store advertises that its employees are "Master Soda Fountain Engineers."

Optimistic autoists who have tried chewing gum, match sticks, flat stones and slugs are slowly discovering these items won't operate city parking meters, but their efforts are a trial to city meter maintainers. Des Moines, Iowa, installed 1,200 meters one week-day, and the next Saturday found 106 out of service via the gum-stone-stick-slug route, reports the International City Manager's Association. Undaunted, however, some 924 communities now have installed the meters.

There's more than one way to make money out of construction. At Monterey, Calif., excavators preparing the way for a business building unearthed about $6,000 in old $20 gold pieces, apparently buried and forgotten by a recluse.

The combination would have been weird enough if Louis Matza had built what the Los Angeles zoning maps prescribed for his small downtown lot. One corner, Matza found, could be used for a commercial establishment, another for a hotel, a third for an apartment and the last for a one-family house. City planning commissioners finally simplified matters by classifying the plot in the commercial zone.

The city of Boston is going to build its first underground parking lot—but doesn't want to be reminded of it. Announcing plans for the 400-car lot under the Fenway, Mayor James M. Curley said the park department will utilize war-learned camouflage to hide the garage so that it will be invisible from the street. Prospective parkers will get location maps, presumably.

Pennsylvania's clean streams program produced an unexpected winter dividend. State highway engineers discovered that gritty culm dredged from the Schuylkill River—mixed with calcium chloride—produced a non-skid covering for ice-coated highways.

MEN AND JOBS

Lyle A. Collins is making a preliminary survey for the design and location of a road and water pipeline between El Paso and the Caroni River in Venezuela for the Iron Mines Co. of Venezuela. He is a 1929 civil engineering graduate of the University of Vermont and was with Socony-Vacuum in the Orient in 1929-32. He has had considerable engineering experience in the United States most recently as contractor's engineer for Lambert Construction Co. and Carpenter Construction Co., both of Vermont, and was engaged in highway construction in that state.

H. M. Marshall, formerly of Spokane, Wash., has been appointed Okanogan County engineer at Okanogan, Wash. He succeeds Mike Davidson, who resigned. Marshall's most recent employment was with the Hanford Engineering Works at Richland, Wash.

The City Planning Commission of Seattle, Wash., has selected **John D. Spaeth, Jr.** of Buffalo, N. Y., as director of planning for one year. He has been made chief planner at Buffalo.

Col. Holland L. Robb, La Crosse, Wis., commanding officer of the 32d Engineer Construction Group charged with the construction of Misawa Air Base, one of the largest installations of its kind in Japan, is returning to the United States for reassignment. A veteran of both wars, he served overseas with the Army Expeditionary Force in Europe in 1917, with the 47th Engineers in Hawaii in 1941-42, with the 1331st Engineers in France during the Rhineland campaign of 1945, and with the XXIV Corps in Korea in 1946. He was graduated from the United States Military Academy in 1916 and Massachusetts Institute of Technology in 1921. He is also a graduate of the Command and General Staff School. During the last ten months, Colonel Robb has been engaged in the construction of Misawa Air Base on the northern tip of Honshu Isand. It is one of the last major constructions of a tactical air base in Japan, and is being prepared for occupancy by units of the United States Air Force.

Francis B. McDowell, Jr., assistant manager and engineer for the Charleston, S. C., waterworks commission, has been made manager and engineer. With the department for more than 30 years, he succeeds **Col. John B. Hughes,** former U. S. district engineer at Charleston.

John C. Adams, formerly assistant city engineer of Fargo, N. D., is now city engineer of Crookston, Minn.

J. E. Albright, city engineer since 1935 and public works director of Marshall, Tex., has been appointed manager of airports at Midland, Tex.

T. W. Ogilvie, Lassen, Calif., county engineer, has also been appointed county road commissioner. He has resigned as district engineer of the Susanville sanitary board. W. R. Jennings, city engineer of Susanville, has been relieved of his extra duties as [illegible] inspector and will serve instead on the sanitary board replacing Og[illegible] addition to his city engineering [illegible]

Norman W. McPherson, has [illegible] the British Columbia department of public works as assistant deputy minister, and is expected to take over the deputy minister's post when **A. L. Cat[illegible] ruthers** retires in June. McP[illegible] formerly was commissioner of highways in Alberta.

The firm of Burns and K[illegible] Inc., consulting engineers of Bost[illegible] Mass., has announced that **Ivan [illegible] Buchanan** is now associated with them in charge of their sanitary engineering section. He formerly was associated with Hayden, Harding and Buchanan until early in 1941 when he entered the service of the Corps of Engineers on sanitary engineering activities.

M. J. Rutledge has been appointed city engineer of St. Lambert, Que.

John M. Neff and son, **John Elwood Neff,** of Neff Engineering and Construction Co., have been appointed as planning engineers for the Salt Lake City municipal airport improvement program.

Win Templeton, Ogden, Utah, city engineer for the last six years has resigned to enter private business in Salt Lake City. Formerly he had been Ogden district resident engineer, Utah road commission.

Mike P. Davidson has resigned as Okanogan County Engineer at Okanogan, Wash.

Alvin C. White and **H. V. Jorgesen** have formed the Seattle Civil Engineering Co., in Seattle, Wash. White served as a county engineer in Minnesota from 1914 to 1938, engaged in contracting work from 1938 to 1943 and in the latter year became a district engineer for King County at Seattle, a position he left to form the engineering company. Jorgesen also was a county engineer in Minnesota, from 1919 to 1942, and since has been with the Public Roads Administration.

Eugene L. Lehr, Manchester, Conn., has been appointed town engineer and director of public works for Fairfield. Mr. Lehr was graduated from Cornell University in 1927 with a degree in civil engineering. He has been employed in Nassau County, N. Y., and spent several years before going to Connecticut on the design of municipal

Leading a hardy group of sightseers that attended the annual meeting of the American Society of Civil Engineers in New York, the excursion committee, (l. to r.) Nomer Gray, Irving F. Ashworth (chairman), Raymond L. Brandes and Charles B. Molineaux enjoyed the boat trip around New York harbor.

construction. He has a wide experience on water distribution, water supply, sewage plants, sewers, incinerator construction and road work. In Connecticut he was engaged in 1938 as a sanitary engineer in the State Department of Health.

H. L. Briggs, chief engineer of the Winnipeg, Man., hydro-electric system, has been named assistant general manager, and **R. T. Harland** has been appointed assistant principal engineer for that organization.

J. Earl Hewes has been appointed superintendent of maintenance and construction in the Chautauqua, N. Y., County highway department. He has been a member of the department for the last 25 years and a foreman for the last 20. He succeeds **Harry Fenton**, resigned.

Frank G. Mallette, Ames, Ia., division maintenance engineer for the Iowa Highway commission at Atlantic for 14 years, has resigned to become Cass County engineer, replacing **T. E. Martin**, resigned. **Harry Porter** of Hamburg has been named to replace Mallette with the highway commission.

Frank M. Williams has been appointed assistant director and chief departmental engineer of the Ohio Highway Department, Columbus. A graduate of Akron University, Williams was released from the Army in May, 1946, after service as a captain in a signal company on Okinawa. He was executive assistant of the highway department from 1940 to 1943.

Jack Olson has resigned as deputy city engineer at Kokomo, Ind., to enter private business.

Joseph Harris has been named city engineer at Sharon, Pa., succeeding **Griff Nocholass**, who held the post for six years.

Lloyd T. Keefe, Rockford, Ill., has been appointed chief planner for the Toledo-Lucas County, Ohio Plan Commission, and **George Vilican, Jr.**, Detroit, assistant planning engineer.

City Highway Engineer **Gunnar E. Soderberg** of Akron, Ohio, started his 31st year as an employee of the city recently, having been named an assistant engineer Jan. 29, 1918.

Keith A. Murdoch has been named city engineer of Claremont, Calif., to succeed Lee C. Mahoney, who recently resigned.

Garrett L. Withers, of Dixon, Ky., has been appointed commissioner of highways, Kentucky Department of Highways, succeeding J. Stephen Watkins who resigned to resume his consulting engineering practice, with offices in Lexington, Ky.

George M. Hitchcock does double duty as smoke-control engineer and water works superintendent of Cumberland, Md. He succeeded the late Charles J. Bruce, former superintendent of the water department of that city.

Alfred Hallaran, left, and Frederick J. Hayles, right, recently retired from the Corps of Engineers, Los Angeles district, pose with District Engineer Col. A. T. W. Moore. Halldran, formerly purchasing officer in the procurement and sales section of the district, joined the corps in 1907 in San Francisco, while Hayles, inspector in general construction, enlisted in Fort Mills, Philippines, the same year.

Midwestern delegates to the recent NSPE annual meeting in Buffalo, N. Y., included Duncan M. Campbell, chief engineer, Cook County Highway Dept., Chicago (left), and Thomas R. Jacobi, formerly city engineer of Indianapolis, Ind., and now with the Public Administration Service, Chicago (right). Paul H. Robbins, executive-director of NSPE, completed the trio.

Regional and project officials discuss plans for electrical installations at Shasta Dam, Calif. Left to right, are Assistant Regional Director R. A. Calland, William J. McCrystle, acting construction engineer, Irving C. Harris, recently retired, and Richard L. Boke, regional director. Three 75,000 kw. generators are now being installed.

Iowa engineers seek to unify professionals

State society discusses uniform building code, state-wide flood control

Three problems of high local importance and broad significance formed the basis of the program of the 59th annual meeting of the Iowa Engineering Society in Des Moines Feb. 17 and 18.

These problems concerned unification of the many autonomous engineering groups in the state, a uniform state building code and a state-wide flood control program. Interspersed on the program were many other papers of local interest relating to bridge foundations, power trends, construction costs, secondary roads, and new building methods.

In a move to reap the benefits of unification of local engineering groups and local sections of national societies with the Iowa Engineering Society, and at the same time to set a national pattern in group cooperation on the local level, the meeting adopted a program of action drawn up by a special committee under the chairmanship of C. Maxwell Stanley of Muscatine. It would seek to have the local engineering clubs of the state come into the society as sections; to encourage formation of sections in many new communities; and to adopt the uniform classification of engineers in the society and local groups that is recommended by the Engineers Council for Professional Development. A certain proportion of dues would be refunded the local groups for local use, and at the same time the society would extend its own services and meetings into all areas of the state. Carrying forward the development of the program was adopted as a major project for 1948.

Prof. Frank Kerekes of Iowa University, the retiring president of the society, as chairman of the Iowa Building Code Commission, set up last year by the state legislature with the active support of Governor Robert D. Blue, brought the society into active work on drafting a code by holding a special session on the subject. This too will be a major project for 1948.

Flood control

The third problem for 1948 is to develop support for formation of a state water conservation and flood control body or national resources council with authority to draw up a state-wide plan and to pass on and approve specific projects. The legislature, after the 1947 flood, set up an interim committee, which worked with the Army Engineers on the first flood control reservoir recommended for the state, to be located at Coralville, but the committee has no further authority or permanent status. To acquaint the members with the need and plans for a state natural resources council, a symposium on land conservation and flood control was a part of the convention program. Prof. J. W. Howe, University of Iowa; Kirk M. Sandals, U. S. Soil Conservation Service; Col. W. N. Leaf, engineer of the Rock Island Engineer District and David M. Harker, chief engineer, Indiana Flood Control and Water Resources Commission, were the speakers.

At the annual banquet closing the meeting, some 300 members and their wives witnessed the presentation by F. M. Dawson, dean of engineering at the University of Iowa, of the Anson Marston Award for outstanding service to C. Maxwell Stanley, and heard addresses by Governor Blue and Waldo G. Bowman, editor of *Engineering News-Record*. William P. Nemmers, consulting engineer of Des Moines, was elected president for 1948.

Set 6-year program for Missouri basin

A six-year program that will become a master blueprint for the guidance of federal and state agencies in the development of the Missouri River Basin was released in final form last week by the Missouri Basin Inter-Agency Committee.

The plan calls for six-year total expenditure of $2,399,000,000 by five federal agencies, and $92,961,000 by the governments of nine states within the river basin.

A decision on the program was reached at a conference held in Lincoln, Neb., under the chairmanship of Maj. Gen. Lewis A. Pick, committee chairman and Missouri Valley division engineer for the Corps of Engineers. General Pick said the program represents a summary of the construction schedules toward which the federal and state agencies will concentrate their efforts, consistent with federal appropriations and availability of state funds.

Under the plan government agency expenditures will include: Bureau of Reclamation, $1,210,000,000; Army engineers, $748,200,000; Department of Agriculture, $433,876,000; Federal Power Commission, $939,000; and Department of Commerce, $5,421,000. State expenditures will include: Missouri, $17,022,000; Kansas, $4,535,000; Iowa, $4,893,000; Nebraska, $25,114,000; Colorado, $3,639,000; North and South Dakota, $12,000; Wyoming, $1,907,000, and Montana, $22,586,000.

Would oust unregistered Ohio county engineer

A suit for an injunction to prevent the employment of an unregistered engineer as county engineer of Warren County, Ohio, was filed recently in the Warren County Common Pleas Court at Lebanon, Ohio.

Sponsored by the committee on grievances and ethics of the Ohio Society of Professional Engineers, the suit is aimed at the employment of Hershel C. Stiles, who was recently named county engineer upon the resignation of his predecessor. Although Mr. Stiles is not registered as a professional engineer or surveyor as required by Ohio law, county commissioners defended their action on the ground that they had been unsuccessful in finding any qualified individual who would accept appointment in view of the small annual salary of $2,900.

The entire Ohio engineers and surveyors act itself was also under attack last week, when Harry F. Shuey and Marion M. Shuey, operators of the Oakwood Tool & Engineering Co., of Dayton, filed suit in Montgomery County Common Pleas Court, alleging that the act itself was unconstitutional.

The Shueys, who do not hold registration for the practice of engineering, base their attack on the statute on a decision of the Illinois Supreme Court in 1944, when that court held a similar law unconstitutional. The state Society of Professional Engineers and its Dayton chapter have filed briefs opposing

N. Y. seeks power to halt misuse of engineer title

A bill seeking to obtain the right of procedure by injunction against violations of the State Education Law of professional engineers and land surveyors is now before the New York state legislature at Albany.

Sponsored by a legislative committee, the State Education Department, the State Board of Examiners of Professional Engineers, and the state organizations of the American Society of Civil Engineers and the Society of Professional Engineers, the measure would make it possible to obtain injunctions against persons or organizations accused of misappropriating the designation "engineer."

The action is parallel to that recently started in British Columbia, Canada (*ENR*, Feb. 12, vol. p. 220) where registered engineers asked the provincial legislature for power to use injunction to bar unregistered engineers from practice in the province.

Propose $114 million N. Y. pier program

Port of New York Authority offers 12-year plan to improve land access and provide public markets

The Port of New York Authority, continuing its current program for the modernization of the Port of New York, last week made a formal offer to take over all of New York City's city-owned piers for a $114,000,000 modernization program.

The authority—a bi-state organization of New York and New Jersey, that built and operates such facilities as the George Washington Bridge, the Holland Tunnel and New York and Newark's airports—has already made similar offers to the cities of Hoboken and Newark, N. J.

In a formal 50-page report, the authority said that most of New York City's piers were built for horse-and-wagon transfer and not for trucks, and pointed out that some piers still in use were built to accommodate sailing ships. The organization proposed that over a 12-year period it would build six new steamship piers, would modernize 14, and rehabilitate 56. Additionally, the 35 railroad car-float transfers would be consolidated into four, and a $27,000,000 union produce terminal would be built into a half-mile long pier near the present Washington Market in downtown Manhattan. A parking space for patrons and workers would be built near the new market, under the plan.

The offer to New York City includes payment to the city of all net revenues over debt service and required reserve until 1960, when rehabilitation would be completed. Thereafter, three-fourths of the net revenues for the remainder of a 50-year lease would be turned over to the city—a sum estimated at about $5,650,000 annually.

Relieve congestion

The authority's plan for relieving present traffic congestion at existing piers is to build new headhouses, usually on piles astride the existing bulkheads, with room inside for load transfer and hoists for handling goods to a second story. This would open up 80 ft. of width in front of the piers. New piers would be built 500 ft. wide to permit trucks to follow a "U" traffic pattern on the pier itself.

The proposal was prepared by the authority's engineers under Walter P. Heddon, director of port development. It is based on a survey of all existing facilities, made by Allen N. Spooner and Son, Inc., Frederick Snare Corp., and J. Rich Steers, Inc. Frederick R. Harris Inc. and Knappen Engineers Co. are consultants on pier design, and Parsons, Brinckerhoff, Hogan and MacDonald assisted on operation and maintenance studies.

See need of $7.4 billion school building

The U. S. Office of Education said last week that $7,400,000,000 should be spent for improvements to bring the existing facilities of the country's elementary and secondary schools up to standard and to provide expansions needed during the next five years.

This total includes about $800,000,000 of work desired by non-public elementary and secondary schools. However, it does not include the $1,000,000,000 construction program U. S. colleges and universities now have under way, nor the $2,600,000,000 of additional work these institutions are planning with federal aid (*ENR* Jan. 29, vol. p. 162).

Big enrollment expected

During the years 1933 to 1947 about $300,000,000 was spent yearly on elementary and secondary school improvements, based upon the 1947 construction costs, the education office said.

Using data from representative states and applying this information to the entire country, the federal agency reports that the present enrollment in public elementary and secondary schools now totals about 25,700,000 and in similar non-public schools 3,000,000. By 1955 it is conservatively anticipated that the enrollment will be 28,700,000 in public institutions and 6,300,000 in the other schools.

The office of education stressed that if kindergarten facilities are provided for all 5-year olds, 1,700,000 students additional would be added to the figure, and added that there are some 4,690,000 children of the ages 16 to 19 not in school.

Therefore the federal agency believes that it is safe in stating $7.4 billion of new improvements will be needed by the 110,000 public school districts in the U. S. and the private groups. The 110,000 U. S. public school districts must spend about $5,300,000,000 for actual construction, nearly $900,000,000 for remodeling and reconstruction, over $800,000,000 for purchase of equipment, but not including special laboratory facilities and $370,000,000 for purchase of new sites.

Seek new financing for Delaware bridge

The Delaware State Highway Commission said last week it would make new efforts to finance the $40,000,000 Delaware Memorial Bridge near Wilmington, after recent bid openings indicated actual costs would be far above original estimates (*ENR* Jan. 22, vol. p. 100).

The commission said: "The State Highway Department has been negotiating with an underwriting syndicate for the sale of revenue bonds to finance the construction of the bridge. These negotiations have not proved successful and have been abandoned.

Meanwhile, notices have been given the present employes of the bridge division of the State Highway Department, including its director, Lieut.-Gen. Eugene Reybold, (ret.) former chief of the Army Engineers, their connection with the division would end this month.

Should present negotiations with financial groups show that it is possible to underwrite the project before the end of the month, the force will be recalled and arrangements will be made to start work immediately.

Robert P. Lamont dies; engineer-industrialist

Robert P. Lamont, 80, a civil engineer who became one of the nation's leading industrialists and served as Secretary of Commerce in the cabinet of President Herbert Hoover, died in New York City Feb. 19.

A native of Detroit, Mich., Mr. Lamont took a civil engineering degree at the University of Michigan in 1891, and served as an engineer for the World's Columbian Exposition, Chicago, 1893, and as engineer for a Chicago contractor, supervised the construction of several of Chicago's water-supply tunnels, excavation for the Boston, Mass., subway, and many other construction projects.

After five years of such work, Mr. Lamont was one of the founders of the Simplex Railway Appliance Co., which later became affiliated with the American Steel Foundries—of which Mr. Lamont became a vice-president. He later became a director of many large industrial concerns, including the International Harvester Co., the Globe Steel Tubes Co., and the Illinois Bell Telephone Co.

He entered Mr. Hoover's cabinet in 1929, and remained there until 1932, when he resigned to become president of the American Iron and Steel Institute.

Italian State Railways replaces old stone arches with concrete rigid frames to lighten lo

Concrete Rigid Frames Ris

One of the largest reconstruction jobs facing the Italian State Railways at the end of the war was the rebuilding of the viaduct of Desenzano, which carried the double-track main Milan-Venice line across a broad valley a few miles below the Lago di Garde. The resultant structure, built on stubs of the original piers, is a series of 16 concrete rigid frames of imposing appearance and modern design. It also reduces foundation pressures sufficiently to overcome dangerous settlement that had been experienced since the early viaduct was completed.

More than a century old, the original Desenzano viaduct consisted of 17 arches with a span of about 51 ft. each, and reaching a maximum height of about 100 ft. All in brick, save for large blocks of stone at the corners of the piers, the ogival arches with brick merlons on top gave the structure something of the appearance of a medieval fortress. During the war, four of the arches were destroyed, two of them by Allied bombardment and the other two by German demolition where the area was abandoned.

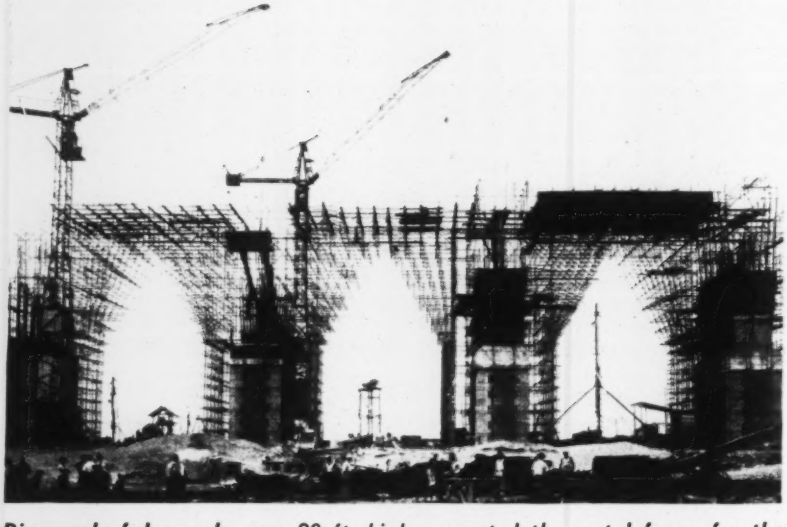
Even before this occurred the viaduct had caused grave concern. Though attempts had been made to lighten its weight during construction by giving the arches a cellular form, the unit load on the foundations was still 5 tons per sq. ft., and settlement resulted. Furthermore, the arch pressure lines departed from the axes in varying amounts, and efforts to remedy this by a complicated system of stay-rods in the internal chambers were not fully successful. Continuous repairs were necessary and, from the beginning of use of the line, train speed over the viaduct had to be reduced to 26 mph.

Various permanent remedies had been considered: to rebuild the viaduct completely, rerouting traffic meantime; to build a new viaduct below the present one; or to throw up a great embankment to replace the viaduct, since little water flows through the valley.

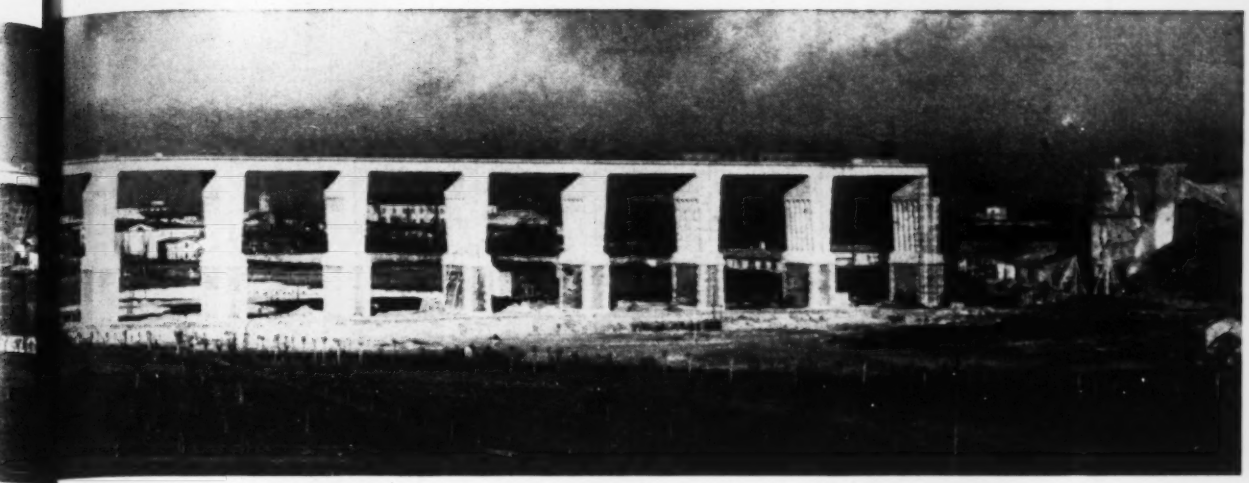
Finally, following the war damage, and in view of the shortage of materials, it was resolved to retain the same piers but to reduce the weight on them by building a new structure of independent reinforced-concrete rigid-frames. This lightest-possible construction also offered the important added advantage of opening up the beauties of the view down the valley.

As it is being rebuilt the viaduct consists of 16 frames, each of them with a clear-span at the top of 57 ft. and a height of 55 ft. above the stubs of the old piers on which they rest. Distance center to center of the piers is 72 ft., and the total length between abutments is 1230 ft. The tracks on the viaduct have a grade of about 1 percent.

The frames each consist, both in the flat and vertical sections, of a rein-



***Pipework falsework** over 90 ft. high supported the metal forms for the rigid frames. Mobile cranes placed the concrete with bottom-dump buckets.*



foundations and provide a sturdy structure to accommodate modern train loads and speeds.

On Old Stone Viaduct Piers

forced slab with six ribs. As a design load, a train consisting of two 161-ton locomotives and a limitless number of cars was adopted. Such a train would distribute on the frames a uniform load of 4 tons per ft. For the dynamic effect, an increase of 29 percent was added. The greatest unit stress resulting from this calculation is 865 psi for the concrete and about 24,000 psi for the steel.

The new structure reduces the unit load on the foundations to about 3 tons per sq. ft. which should suffice to avoid future sinking.

When the work started, late in March, 1946, the question of how the old arches should be demolished presented a major problem, because of the need not to damage the remaining piers. It was felt the normal method of proceeding—erection of centering around the arches and demolition by hand and air drills—would be far too slow.

Demolition by dynamite

Instead, demolition was accomplished by dynamite charges. The superstructure was first gradually removed from the arches, in this fashion. Then, after covering the surrounding ground with a layer of faggots to absorb some of the shock of falling masonry and so prevent damage to the piers' foundations, numerous small mines were placed in the keystones, and the whole remaining structure was blown up at once. This was accomplished without any damage to the piers, and demolition was completed in September, 1946.

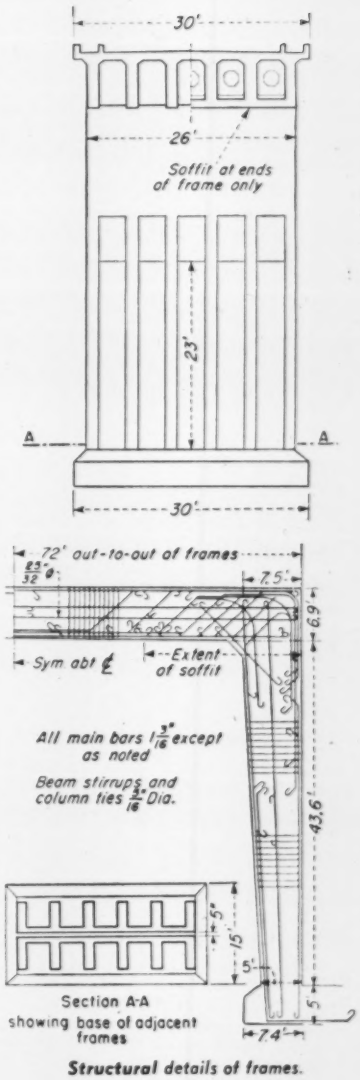
Pipe scaffolding 100 ft. high was used with complete success in building the new structure. Metal forms were also used for the concrete. Counterweight cranes moving on tracks at each side of the scaffolding lifted the concrete in bottom-dump buckets.

Construction of the frames began in June, 1946, and after a two-month winter layoff work had reached the 13th frame by April, 1947. The new viaduct was expected to be placed in service by early 1948.

The Venice end of the viaduct will be finished differently, however, from the rest. The old abutment on this end had already, at the time of its construction, shown a slight rotation under the pressure of the embankment, so that it had been necessary to build a wall between it and the first pier, closing in the first vault and acting as a strut to oppose the rotation.

When this wall was demolished it was found the abutment, on 92 ft. of its height, had a twist of nearly 15 in. It was decided to utilize the same principle of using the neighboring pier to counteract this thrust, and construct two thick walls between abutment and pier. Both the walls and the pier rest on a single slab of reinforced concrete, and the foundation is reinforced with piles of prestressed concrete. Similar piles were used on three other piers, which had to be rebuilt because their old timber piles were found to have rotted.

Nearly 65,000 cu. yd. of demolition had to be done, and 20,000 cu. yd. of concrete poured. Roberto Pedrocco, was in charge of the work for the State Railways. (*McGraw-Hill World News*)



Structural details of frames.

WORLD'S LARGEST,

Keeps Big Loader Operating

HD-19 MORE THAN SUPPLIES POWER REQUIREMENTS OF EUCLID LOADER...SAVES 50 TO

On Terry & Steadman's Louisville Flood Wall job the new Allis-Chalmers HD-19 hydraulic torque converter tractor proved it has plenty of power to operate the big Euclid loader at capacity. Even though the ground was not scarified, the HD-19, unassisted, pulled the big machine as fast as the belt could handle the material.

And because of the torque converter, operator could start and stop tractor with throttle. Since 50 to 60 loads were obtained each hour, this many master clutch engagements were saved...obviously lengthening life of clutch. Torque converter also provided smooth, cushioned starts and stops—making it easier on tractor, loader...and operators!

MOST POWERFUL TRACTOR

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9 CLUTCH ENGAGEMENTS PER HOUR

Whatever the job...pulling loaders or scrapers, or working with bulldozers...the powerful, smooth-operating, fast-working HD-19 will lower your costs, increase your profits.

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IT'S RUGGED AND TOUGH . . . BUILT TO OUTPRODUCE & OUTLAST!

Weight: 40,000 pounds.

Power: 2-Cycle General Motors Diesel — 163 hp. at flywheel.

Speeds: 0 to 3 in low gear and 0 to 7 in high; reverse 0 to 5.5.

Torque converter automatically balances load and speed without gear shifting.

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ENGINEERING SCHOOL NEWS

Several institutions plan new curricula—Georgia Tech. may change its name—New engineering deans—New type of recording seismograph in service at Harvard

A number of engineering schools are planning or considering changes in their curricula to adapt them better to current conditions.

Gordon M. Fair, dean of the Harvard Graduate School of Engineering, has announced a new program to provide research training and experience for engineers planning careers in industry and government. It will require two years of study beyond the bachelor's degree and will lead to a Master of Engineering degree. The course will start next fall.

Thorndike Saville, dean of the College of Engineering at New York University, has proposed to the chancellor of the university the adoption of a 4-year general engineering course leading to the degree of bachelor of engineering. This would be the terminal degree for all but the few who desire to take advanced study leading to master's or doctor's degrees. The senior year would provide a wide choice of electives for those who plan to go into administrative or sales work in industry. Those who plan advanced work could begin specilization in the senior year.

An overhauling of graduate school programs to provide better science training is advocated by Provost Arthur S. Adams of Cornell University. He proposes a system of "professional counseling" in which leading scientists would offer guidance to promising science students.

The Polytechnic Institute of Brooklyn, N. Y., will offer the new degree of Master of Science in Applied Mathematics.

The alumni of Georgia Tech by more than three to one have voted to endorse the change in name of their alma mater from "Georgia School of Technology" to "Georgia Institute of Technology." A poll of the faculty indicates a slight majority in favor of a change.

Elmer Charles Easton, assistant dean of the faculty of the Graduate School of Engineering at Harvard University, has been appointed dean of the College of Engineering of Rutgers University, effective July 1. Dr. Easton succeeds Dean Parker H. Daggett, who was granted a leave of absence last May. Dean Easton was graduated from Lehigh University a bachelor of science in 1931. He received his master's degree at Lehigh in 1933 while holding a research fellowship. He was awarded his doctorate at Harvard in 1942. In 1935 he became an instructor in mathematics at the Newark College of Engineering, was promoted to assistant professor in 1940. In 1942 he joined the staff of the Graduate School of Engineering at Harvard.

Samuel W. Dudley, dean of the Yale School of Engineering and director of the university division of engineering, will retire from the faculty July 1. His service began in 1921 and he has been dean since 1936. Walter J. Wohlenberg, Sterling Professor of mechanical engineering, will succeed Professor Dudley as dean of the School of Engineering.

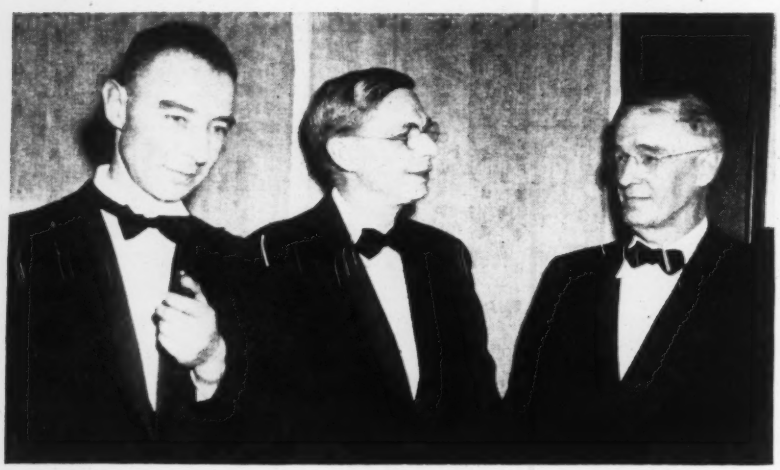
John M. Gallalee, professor of engineering, has been named president of the University of Alabama.

Norman Lincoln Towle is acting dean of the Cooper Union School of Engineering, following the recent death of Dean George F. Bateman. Professor Towle is senior member of the faculty, having been appointed instructor in 1920.

A newly-developed seismograph which records earth tremors on tape for direct readings has been placed in service at Harvard University. It was designed by Roland K. Blumberg, a graduate student of geology. The new equipment records horizontal motion in north-south and east-west directions, as well as vertical motion. The record is presented by three ink lines on tape paper.

Two gifts for scholarship funds at the University of Iowa college of engineering have been accepted. Fred Stebler, Riverside, Calif., is the donor of common stock valued at approximately $16,000. Income from it will be used to establish the Fred Stebler scholarship, to be awarded each year to a needy and worthy engineering student. An addition of $1,000 to the funds providing the B. J. Lambert scholarships in engineering has come from Nathan Wohlfeld, Dallas, Tex.

Directors of the Carolinas branch, Associated General Contractors of America, have voted to undertake the raising of $100,000 as an endowment fund for the course in construction engineering which is conducted at North Carolina State college.



At 100th Anniversary—Recognition of Harvard University's contributions to engineering education was emphasized at a dinner in Boston, Mass., on Feb. 13 in celebration of the 100th anniversary of the founding of the Lawrence Scientific School. While that school ceased to exist 40 years ago, it was the predecessor of the university's present Graduate School of Engineering. At the centennial dinner President James Bryant Conant of Harvard was toastmaster. Other speakers were J. Robert Oppenheimer, director of the Institute for Advanced Study at Princeton, N. J., and Vannevar Bush, director of the Carnegie Institution in Washington. Left to right above, are Drs. Oppenheimer, Conant and Bush.

OBITUARY

Daniel A. Lindow, 51, who had been a structural engineer with the Public Buildings Administration of the Federal Works Agency in Washington, D. C., since January, 1946, died in that city Feb. 12. Mr. Lindow, obtained his engineering education at the University of Michigan and went to Washington in 1936. He worked on construction for the W. C. & A. N. Miller Development Co. and the War Department before joining PBA.

Reuben M. Hyde, of Wollaston, Mass., a civil engineer employed by the Eastern Massachusetts Street Railway for 45 years, died Feb. 8.

Frank D. Collins, 68, a retired civil engineer, died recently in St. Louis, Mo. Prior to his retirement in 1944, he was with the American Bridge Co. for 42 years, most of the time in St. Louis.

W. H. Kelly, 55, civil engineer, died at Aylmer, Que., Feb. 7. A graduate of McGill University in 1916, he went overseas in the first world war, and on his return started business as the Canada Construction Co. Ltd., handling much road building and municipal work.

James Causten Shriver, 77, civil engineer, died Feb. 4 in Cumberland, Md. A graduate of Lehigh University in 1892, he was the designer of Cumberland's sewer system and later served as city engineer.

Frank Mack, 67, retired Panama Canal Zone engineer, died Feb. 9 in Bethesda Naval Hospital, Maryland. In 1907, he entered the service of the Isthmian Canal Commission. During World War I, he was commissioned in the Army Engineer Corps and served in France.

Nelson A. Ringwood, 38, former town engineer of Rotterdam, N. Y., died in Albany, N. Y., recently. He was a graduate of Rensselaer Polytechnic Institute, 1930. In 1938 he became affiliated with Barker & Wheeler, engineers, of Albany and was resident engineer on the construction of a sewer system and treatment plant for Rotterdam. In 1944 he became the town engineer and in September of 1947 returned to Barker & Wheeler.

Joseph A. Reece, 52, president of the Toledo chapter of the Ohio Society of Professional Engineers, died Feb. 7. He organized the Toledo Technical Council in 1945, and was made president. He was an estimating engineer for the Surface Combustion Co., Toledo, for 20 years.

Col. Lee N. Seaman, 65, died in Halifax, N. S., Feb. 5. He was graduated in civil engineering from Nova Scotia Technical College, Halifax, N. S., 1914. He served in the Canadian active army in the first world war. In 1920, he went to India where he was engaged in engineering work with the British government.

Willis C. Fulton, 62, of Bellemoor, Del., construction engineer for the McCormick Construction Co., Wilmington, Del., was fatally injured on Feb. 6 in an automobile accident.

James P. Gallager, 76, died at Little Rock, Ark., Feb. 5. He was an engineer with the state highway department maintenance division.

George J. Roberts, 84, civil engineer, died at Richmond, Va., Feb. 12. He was a graduate of Stevens Institute of Technology, 1884. He had been associated with the United Gas Improvement Co., Philadelphia, Pa., and the Public Service Corporation of New Jersey. In World War I he was chief of ordnance, USA, for the Greater New York district.

Shirley Baker, 74, senior member for many years of the San Francisco firm of consulting engineers, Baker, Carpenter and Waters, died Feb. 10 in Palm Springs, Calif. A member of the first class to graduate from Stanford University, Mr. Baker was in charge of the construction of Stanford Stadium.

Randolph Martin, 65, associate highway engineer, PRA, died in Springfield, Ill., Feb. 13.

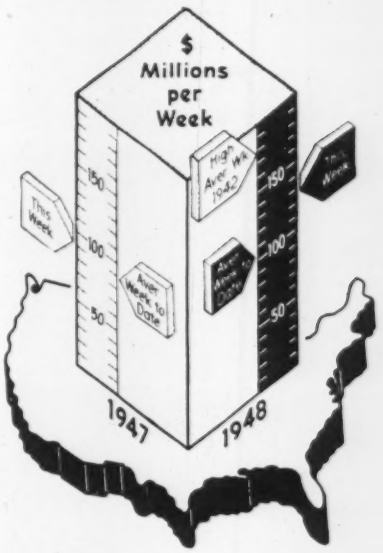
Roy J. Short, 57, manager of the Minnesota highway planning division, died in St. Paul, Minn., Feb. 13.

John C. Riddell, 48, civil engineer and manager of the Peterson Construction Co., Salina, Kan., died Feb. 19.

Henry J. Conant, 81, engineer, of Brookline, Mass., died in Clearwater, Fla., Feb. 14.

Richard M. Merriman, 65, a civil engineer who directed a great many large construction projects both here and abroad, died in Pasadena, Calif., Feb. 9.

CONSTRUCTION ACTIVITY



As Reported this week to . . .
Engineering News-Record

CONTRACT VOLUME

Continental U. S. Only (Thousands of Dollars)

	Week of Feb. 26 1948	Cumulative 1948 (9 wks.)	Cumulative 1947 (9 wks.)
Federal	$51,890	$190,415	$71,945
State & Mun.	27,712	291,644	207,954
Total Public.	$79,602	$482,059	$278,979
Total Private	49,139	434,539	508,482
U. S. Totals.	**$128,741**	**$916,598**	**$787,461**

WHERE CONSTRUCTION ACTIVITY ORIGINATED THIS WEEK

Dollar Volume (Thousands)

Type of Work	This Week	Cumulative 1948 (9 wks.)	Cumulative 1947 (9 wks.)
Waterworks ...	$1,258	$29,326	$19,068
Sewerage	3,991	25,160	15,956
Bridges	4,589	32,922	22,626
Highways	8,227	105,689	75,884
Earthwork, Waterways	27,253	92,951	21,913
Buildings, Public	31,732	137,581	84,897
Industrial ...	9,212	116,111	134,909
Commercial ..	34,984	277,123	325,926
Unclassified ...	7,495	74,735	89,282

NOTE: Minimum size projects included are: Waterworks and waterway projects, $28,000; other public works, $50,000; industrial buildings, $68,000; other buildings, $250,000.

NEW PRODUCTIVE CAPITAL

		Cumulative 1948 (9 wks.)	Cumulative 1947 (9 wks.)
NON-FEDERAL	Current		$183,065
Corporate Securities	Figures		17,845
State and Municipal	Not Available		165,160
Total Capital.....			**$183,065**

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost..	Feb.'48	436.89	210.01
Building Cost.....	Feb.'48	329.71	178.23
Volume	Jan.'48	175	77

CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager *J. A. MAHONEY, Reports* *E. R. BIGGERSTAFF, M. R. ROESSLER, Statistics*

WATER SUPPLY

Construction Reports received since this section went to press will be found in Last Minute Construction Reports.

BIDS ASKED

Bids Asked March 1

Md., Towson—County, Baltimore Co., Court House, Towson, 6,448 lin. ft. 6 and 8 in. watermains, 10,054 lin. ft. 8 in. sewers, valves, fire hydrants, manholes, house connections, etc., contr. 123-S & W. Plans deposit $5. Nathan L. Smith, Towson, ch. engr.

Bids Asked March 2

Conn., Hartford—State, F. R. Zeller, comptroller, State Capitol, Water Storage No. 2 reservoir, Fairfield State Hospital, Newtown.

Bids Asked March 3

Tenn., Jordonia—State, Purchasing Dpt., State Office Bldg., Nashville, 150,000 gal. water tank on 125 ft. tower at State Training and Agricultural School for White Boys. Plans deposit $15. J. Sanders Parker, 816 8 Ave. S., Nashville, engr.

Wis., Dane—Village, excavate, lay and backfill 8,900 ft. 6 in. watermain, install 13 hydrants, 15 six in. valves, 114 curb and corp stops, excavate, lay and backfill 3,800 ft. ¾ in. copper service. Plans deposit $10. General Eng. Co., Portage, consult. engr.

Bids Asked March 4

Ga., Douglas—City, 300,000 gal. reservoir, chlorinators, meters, valves and piping. Plans deposit $20. J. B. McCrary Eng. Corp., 22 Marietta St. Bldg., Atlanta, engr.

S. D., Willow Lakes—City, WW sys., incl mains, well, pump house, pumping equip., chlorinator, steel water tank and tower, $70,-000. A. S. Mannes, Western Union Bldg., Aberdeen, engr. CD 6/9—ENR 6/12.

Bids Asked March 8

N. D., Bottineau—City, watermains, 16 fire hydrants, etc. $30,000. Lium & Burdick, 15 N. 5 St., Grand Forks, engrs.

Ore., Mt. Angel—City, City Hall, 300,000 gal. reinf. con. reservoir. Plans deposit $10. John W. Cunningham & Assoc., Spalding Bldg., Portland, engrs.

Bids Asked March 9

Minn., Karlstad—Village, B. N. Folland, clk., Karlstad, water distr. sys., pump house, elevated tank, tower, deep well, pump, etc. $70,-000. Plans deposit $10. W. C. Larson, Detroit Lakes, engr. CD 6/13/46—ENR 6/20/46.

Bids Asked March 10

Calif., Oakland—East Bay Municipal Utility Dist., 512 16 St., concrete pile fdns. for Unit 2 of Mokelumne Aqueduct, Spec. 78. Over $20,000. L. S. Longwell, 512 16 St., ch. engr. CD 12/15/43—ENR 12/20/43.

Bids Asked March 15

Tex., Denison—City, H. Schmitzer, secy., Randol Water Filter Unit at purification plant. $30,000. CD 11/22/44—ENR 12/14/44.

Wis., Wisconsin Rapids—Waterworks & Lighting Comn., master pumping station, 3 St. pump. station well pump stations. Foth & Porath, Inc., 409 E. Walnut St., engr. CD 11/19—ENR 11/27, under LB.

Bids Asked March 16

O., Barberton—James E. McHenry, dir. Pub. Service, City Hall, water treatment plant exten. Plans deposit $10. E. D. Barstow, 21 N. Summit St., Akron, sanitary engr., adv. ENR 2/26. CD 8/30/44—ENR 9/21/44.

Bids Asked March 18

‡Idaho—Bureau Reclamation, Dpt. Interior, Bldg. A, Denver Federal Center, Denver, Colo., furnishing, del. f.o.b. cars shipping point or f.o.b. cars Lewiston, 1 horizontal transverse paddle-type flocculator, 2 vertical paddle-type flocculators, circular-tank-type clarifier, 1 rectangular-tank, drag-conveyor-type clarifier, one circular-tank-type combined flocculator and clarifier, 1 mechanical mixer, 2 dry-chemical feeders, 1 basin level regulator, 2 rate-of-flow controllers, 4 operating tables, four 4- to 6-in. waste valves, four 10 wash valves, sludge pump, one chlorinator, 1 ammoniator for Lewiston Orchards Water Treatment Plant, Lewiston Orchards Proj. Spec. 2124. Walker R. Young, Denver, Colo., ch. engr.

Bids Asked March 23

La., Shreveport—City, Joe C. Pratt, comrs., City Hall, Cross Lake Water Plant addns. Plans deposit $25. Black & Veatch, 4706 Broadway, Kansas City, Zone 2, Mo., consult. engrs.

LOW BIDDERS

La., New Orleans—New Orleans Sewer & Water Bd., 526 Carondelet St., watermains and sewers, Contrs. 177-S, 256-W, 1788, 271-W, 270-W, from Bob Bros., 2400 Cypress St. **$190,729.** CD 10/28.

Okla., Tulsa—City, splash walls, rotary, intake towers and placing sluice gates for Mohawk Reservoir from Standard Paving Co., 2119 E. 11 St. **$268,856.** Est. $300,000. CD 12/15—ENR 1/2/46.

Wash., Bremerton—Gilsap Lake Water Dist., c/o Parker & Hill, archts., Smith Tower, Seattle, Zone 4, Feb. 2, 48,000 lin. ft. 2- to 8-in. water mains from Statewide Constr. Co., 305 Jo Ave. S., Seattle **$44,597.** Over $28,000. CD 1/23.

CONTRACTS AWARDED

Pa., Mt. Lebanon Twp., (near Pittsburgh)—South Pittsburgh Water Co., 238 Brownsville Rd., Pittsburgh, 2 mg. storage tank, to Pittsburgh Des Moines Steel Co., Neville Island, Pittsburgh. Est. **$100,000.** Water Work Service Co., Broad St., New York, N. Y., engr.

Tex., Grand Prairie—City, G. H. Turner, mayor, 6 in. pipes, water line extens., replacement, to W. G. Cullum, Great Natl. Life Bldg., Dallas. **$11,407.** Est. $50,000. Bids 2/7. CD 1/30.

Tex., Monahans—City, c.i. water lines, Purchase and Hire. **$58,000.** Former contract rescinded. CD 1/29—ENR 2/5, under CA.

Tex., Richardson—City, water distr. and sanitary sewers from W. W. Scott, Bryan. **$70,315.** CD 8/28—ENR 9/4, under LB.

SEWERS, WASTE DISPOSAL

Construction Reports received since this section went to press will be found in Last Minute Construction Reports.

BIDS ASKED

Bids Asked About March 1

Pa., Stroudsburg—Stroudsburg Boro, sanitary sewers. $175,000. Albright & Friel, 1528 Walnut St., Phila., engrs., Edward C. Hess, 33 N. 7 St., boro engr. CD 1/31/45—ENR 2/22/45.

Bids Asked March 1

Ont., Dundas—Town, C. J. Nunn, clk., Dundas, storm sewer in Ogilvie St. from King St. to Spencer Creek and repair, enlarge sewer and disposal plant. About $60,000. G. G. Hall, 264 Avenue Rd., Toronto, engr.

Bids Asked March 2

N. Y., Brooklyn—President Brooklyn Boro Hall, Zone 2, combined sewers in E. 48 St. from Linden Blvd to Lenox Rd. and Lenox Rd. from E. 48 St. to Schenectady Ave.

Bids Asked March 4

S. D., Willow Lakes—City, sanitary sewerage sys. and sewage disposal. $50,000. A. S. Mannes, Western Union Bldg., Aberdeen, engr. CD 6/9—ENR 6/12.

Bids Asked March 8

Kan., Olathe—Country Club View Sewer Dist., S. Leonard White, co. clk., Courthouse, Olathe, sanitary sewers serving 23 acre tract to be extended to connect with Grantland Proj. $55,000. E. J. Myers, Law Bldg., Kansas City, Mo., engr.

Nev., Reno—City, City Hall, sewage pumping plant. Over $50,000. Plans deposit $20. E. C. Frisch, city engr. Harry N. Jenks, 345 Madrono Ave., Palo Alto, Calif., consult. sanitary engr. Received no bids 2/16. CD 2/9.

Bids Asked March 10

Ind., Lafayette—State Bov. P. Wks. & Supply, O. M. Hosier, dir., 404 State House, Indianapolis, sewage treatment plant and sewers for State Soldiers' Home. $170,000. Plans deposit $25. Boyd E. Phelps & Assoc., 222 Franklin St., Michigan City, consult. engrs.

Bids Asked March 12

N. J., Ewing Twp.—Town clerk, Township Bldg., Pennington Rd., Trenton, incinerator plant. $125,000. Micklewright & Mountford, 72 Ewing St., Trenton, archts. CD 10/21/46—ENR 11/14/46.

N. Y., New York—President Bronx Boro, 851 Grand Concourse, Zone 51, storm water relief sewer, appurtenances from southerly side E. Tremont Ave., through land acquired for sewer purposes to southerly side Westchester Ave., across Westchester Ave. at point about 285 ft. east of Blondell Ave. and through the Westchester yard of New York City Transit Sys. to Eastchester Rd. at a point about 150 ft. south of Haswell St. then in the easterly side of Eastchester Rd. to point about 140 ft. north of Haswell St.; constructing storm water relief sewer, appurtenances, in easterly side Eastchester Rd. from point about 140 ft. south of Banard St. with an overflow chamber and connection from existing sewer in Eastchester Rd. at point about 50 ft. north of Poplar St. etc. CD 2/4/43—ENR 2/11/43.

Bids Asked March 16

Wash., Pullman—City, City Hall, sewage treatment plant. $200,000. Plans deposit $5. Stevens & Koon, Spalding Bldg., Portland, Ore., engrs. CD 10/2/46—ENR 10/10/46, under LB.

Bids Asked March 30

Calif., Novato—Sanitary Dist. 6 of Marin Co., Novato, sewer lines, sewage pump and treatment works. Over $50,000. Plans deposit $20, $15 refundable. H. N. Jenks, 345 Madrono Ave., Palo Alto, consult. engr. and Thomas & Whipple, 310 University Ave., assoc. civil engr. CD 2/16—ENR 2/18.

LOW BIDDERS

●**Calif., Los Angeles**—Bd. P. Wks., City Hall, 12 rotary filters, 16 steel bins, 4 fertilizer driers, Hyperion Sewage Treatment Plant, from G. F. Atkinson Co., 22223 S. Santa Fe Ave., P.O. Box 279, Long Beach. **$6,295,518.** Est. $5,712,431. CD 2/14/45—ENR 2/8/45.

●**Calif., San Francisco**—Dpt. P. Wks., City Hall, Feb. 11, North Point sludge treatment plant, Spec. 26,223, from MacDonald, Young & Nelson, 251 California St., San Francisco, and J. H. Pomeroy & Co., Inc., 333 Montgomery St., San Francisco, total base bid **$1,770,479.** CD 1/7—ENR 1/15.

Fla., Ft. Lauderdale—City, Jan. 31, sanitary sewer improvs. in Dist. D-1947, from H. L. Ready & Sons, S.W. 20 St., Ft. Lauderdale, **$58,378.** CD 1/7—ENR 1/15.

Miss., Starkville—City, rejected bids Feb. 10, sanitary sewer improvs. L. B. **$567,970.** CD 1/20—ENR 1/29.

Okla., Stillwater—City, Jan. 12, sanitary main sewer exten. and one lift station, from Aspjund Constr. Co., Enid. **$56,093.** Est $65,-000. CD 1/3.

Tex., Austin—City, G. Morgan, mgr., Feb. 3, sanitary sewers, incl. Contrs. D and E, from Taylor Constr. Co., P.O. Box 648, Taylor. **$77,-471.** Est. $75,000. CD 1/26.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks $28,000; other public works $50,000; industrial buildings $68,-000; other buildings $250,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.:

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

♦	Federal Government
●	Project of $1,000,000 or over.
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily